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ABSTRACT

The geography unit is designed for use in upper elementary grades. The unit objective is to help the student learn facts about the landscapes of the United States, the Netherlands, Australia, Russia, and Central Africa, and acquire generic ideas which he can apply to the analysis and comparison of other landscapes. The unit is an attempt to apply David P. Ausubel's concept of advance organizers to an elementary social studies unit. During the first three days of the unit, a conceptual rural landscape model is taught as the advance organizer. The following inclusive organizing model concepts are identified and developed: population, density, culture, earth complex (land, climate, vegetation), and technology. Specific informational data within this general framework is then presented in each case study. Through questioning techniques the teacher leads the student through an analysis of the data. Among the 18 units outlined are the following: 1) the family farm in the United States; 2) the Netherlands; high population density and extensive sheep stations; 4) the earth complex of the U.S.S.R.; huge and cold; and 5) Ituri Pygmies: subsistence hunters and gatherers in Central Africa. An overview, a list of terms used, an outline of unit ideas, and course content including diagrams, pie charts, graphs, tables, maps, and questions are provided for each unit. (RM)

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COMPARATIVE RURAL LANDSCAPES:

A Conceptual Geographic Model

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SP 001 154

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1970

PREFACE

MAR 14 1974

The geography unit Comparative Rural Landscapes by John E. Steinbrink is designed for use in upper elementary grades. As with the other units in this series, the present unit has a conceptual emphasis. The major concepts or ideas are presented and systematically developed by the interaction of sub-concepts with illustrative factual data. In the process, it is anticipated that the student will not only learn significant facts about the landscapes of the countries which are analyzed in the case studies, but will also acquire several generic ideas which he can apply to the analysis and comparison of other landscapes.

This unit differs from other units in the Geography Curriculum Project series, however, in one very significant way--its form of organization is different. This unit is an attempt to apply David P. Ausubel's concept of advance organizers to a unit in elementary social studies. This appears to be the first time such an attempt has been made in elementary social studies. In selecting the advance organizer idea from Ausubel, the Project had two factors in mind: (1) to test the hypothesis of the advance organizer as a facilitator of learning; and (2) to see if the advance organizer increases the cognitive achievement of disadvantaged elementary students.

In this unit, the advance organizer consists of an inclusive conceptual rural landscape model. Mr. Steinbrink had developed his idea of a rural landscape model prior to Project interest in its relationship to the organizer approach.[1] During the first three days of Comparative Rural Landscapes, the conceptual model is taught as the advance organizer. The four inclusive organizing concepts of the model--population density, culture, earth complex, and technology--are identified and developed.

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[1]John E. Steinbrink, "Systematic Geography for Grade 4: A Spatial Systems Approach," Journal of Geography, LXIX(February 1970), 105-107.

In contrast with the inferential mode, which presents factual concepts first, the advance organizer approach presents the abstract, generic, theoretical concepts first. This approach develops an inverse conceptual hierarchy that begins with the broad, inclusive ideas and then presents the specific informational data within the general framework. These ideas are taught explicitly as categories of analysis and synthesis for the organization of data for the subsequent case studies which follow.

Each case study also begins with an advance organizer in which the significant ideas of the model are stressed in relation to the specific sub-concepts of the topic. The data for each case study are presented in a logical, sequential narrative which subsume the concepts of the model, i.e., organizer. Each logically related micro-section of the case study is followed by recall and application questions which reinforce both sub-concepts and the generic concepts. The salient feature of the unit is that every concept and sub-concept is related to the inclusive four-factor model which functions as the fundamental advance organizer.

This unit has been pilot-tested with intact classes in Hancock County School District(Georgia), controlling for the teacher variable and content identify between experimental and control groups. A description of the research design, as well as the results may be obtained from the Project. This unit on Comparative Rural Landscapes serves a dual purpose. It provides elementary students with a systematic unit in geography. It also serves as a substantive vehicle for research in geographic education and learning theory.

M. J. Rice
Project Director

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A--MODELS AND THE RURAL LANDSCAPE

Terms I Need to Use: abstract model/scale model

urban landscape/rural landscape

universal/cross-culture

Ideas I Must Explain:

I can explain the difference between a scale model and an abstract model.

I can define a landscape and can explain how a rural landscape differs from an urban landscape.

I can list the four factors in the rural landscape model.

Abstract Models and Scale Models

In this geography unit we shall learn to use an abstract model. An abstract model shows ideas and how they are related. An abstract model shows how ideas fit together. The abstract model in this unit has four basic ideas.

There are other types of models besides abstract models. There are, for example, scale models. A scale model is a tiny model of something big and real. Globes and maps are scale models. A globe is a round scale model of the earth. We can learn the pattern on the earth by looking at a globe. A map is a flat scale model of a part of the earth's surface. We can learn the pattern of an area by looking at a map of the area. It is important to know that abstract models deal with ideas rather than things.

a. How does a scale model differ from an abstract model?

b. Why is an abstract model more complex than a scale model?

c. Can you make a model of a baseball game? Why is a model of a baseball game a scale model rather than an abstract model?

Landscape

In this geography unit we shall learn about several different rural landscapes. But first we need to know what a landscape is.

Look out of the window. How far can you see? Two miles? One mile? A half mile? Not very far. A person can see only a tiny part of the earth at one time.

You see a landscape through the window. A landscape is that part of the earth you can see and look over. When you drive along the highway, you see many different landscapes.

a. What is a landscape?

b. How large is the landscape of an ant?

c. How large is the landscape of an astronaut orbiting the earth?

d. Can we say that landscapes vary in size?

Types of Landscapes

There are two types of landscapes. They are urban landscapes and rural landscapes. An urban landscape is what we see in a city. Urban means city. An urban landscape has tall buildings, crowded sidewalks, expressways, factories, and many different types of houses. We see many different urban landscapes when we drive in a city.

Rural refers to open country and farming. Every landscape that is not in a city is a rural landscape. Some rural landscapes are made up of farms and farm villages. Other rural landscapes are forests.

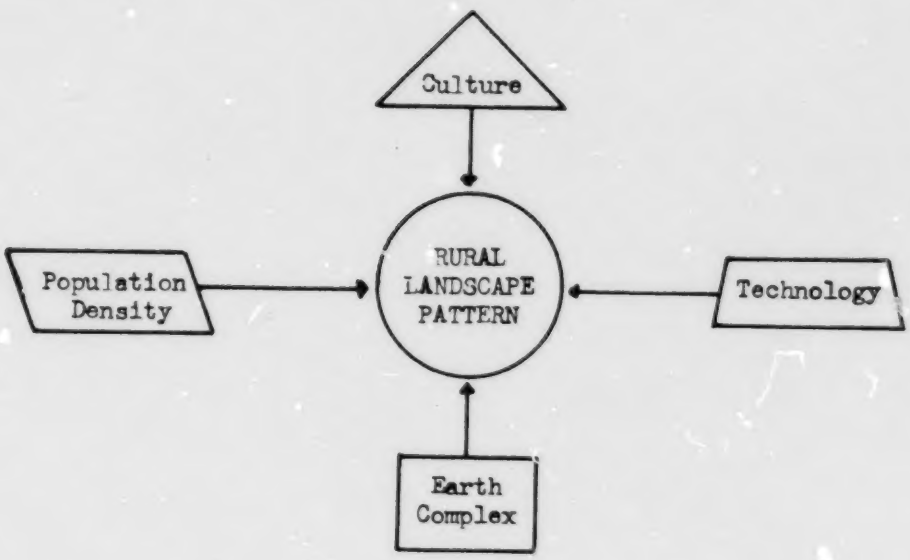
a. How does a rural landscape differ from an urban landscape?

b. Which type of landscape do you see through the classroom window?

The Abstract Rural Landscape Model

The abstract model we shall use in this geography unit has four main ideas. Every rural landscape in the world can be explained in terms of the four ideas in the rural landscape model. The model below shows the main ideas that make up the rural landscape pattern.

A RURAL LANDSCAPE MODEL



a. What are the four main ideas in the model?

b. What do the arrows stand for?

c. What is the purpose of the model?

Pattern

We use the rural landscape model to explain the pattern of rural landscapes. Pattern refers to how the parts of something are put together. If we know the pattern of something, we can predict (tell in advance) how the parts will fit together. If we know the pattern of a car, we can predict where the wheels are on any car.

a. What is the pattern of a baseball field?

b. Can you predict where second base will be on any baseball field?

Rural landscapes in the same area have a similar pattern. Corn landscapes in Iowa have a basic pattern. Forest landscapes in Georgia have a general pattern. Rice landscapes in Japan have a general pattern. Farm landscapes in the Netherlands have a basic pattern.

a. How do the classrooms in your school have a basic pattern?

b. How is a corn landscape in Iowa similar from place to place?

But rural landscapes are not exactly alike. Corn fields in Iowa are not exactly alike. Forest landscapes in Georgia are not exactly alike. Rice landscapes in Japan are not exactly alike. Farm landscapes in the Netherlands are not exactly alike. The parts that make up a landscape are never put together in exactly the same pattern. The pattern of landscapes in an area are similar but never exactly the same.

a. Why are no two classrooms exactly alike?

b. Why are there no two rural landscapes that are exactly alike?

Universal Model

The abstract rural landscape model in this unit is universal. It is universal because it can be applied to any rural landscape in the world. All rural landscapes in the world are affected by these four ideas. Every rural landscape has a population density. All rural landscapes have technology. All rural landscapes show the influence of culture. Every rural landscape is affected by the earth complex.

a. Why is the rural landscape model universal?

b. Would the rural landscape model be universal if it could only be applied to corn landscapes? Why not?

Cross-Cultural Model

The rural landscape model is cross-cultural. It can be used to explain the rural landscape of all people in the world. The rural landscape model can be used to explain the rural landscape pattern of the Japanese, the Australians, the Pygmies in Africa, the Dutch in the Netherlands, and the Americans in the United States. We shall study more about these cultures later.

a. Why is the rural landscape model cross-cultural?

b. Would the rural landscape model be cross-cultural if it could not be applied to rural landscapes in India? Why not?

B--THE RURAL LANDSCAPE MODEL:
EARTH COMPLEX AND CULTURE

Terms I Need to Use: complex

earth complex - land, climate (temperature, rainfall), vegetation

culture - shelter, settlement pattern, crop tradition

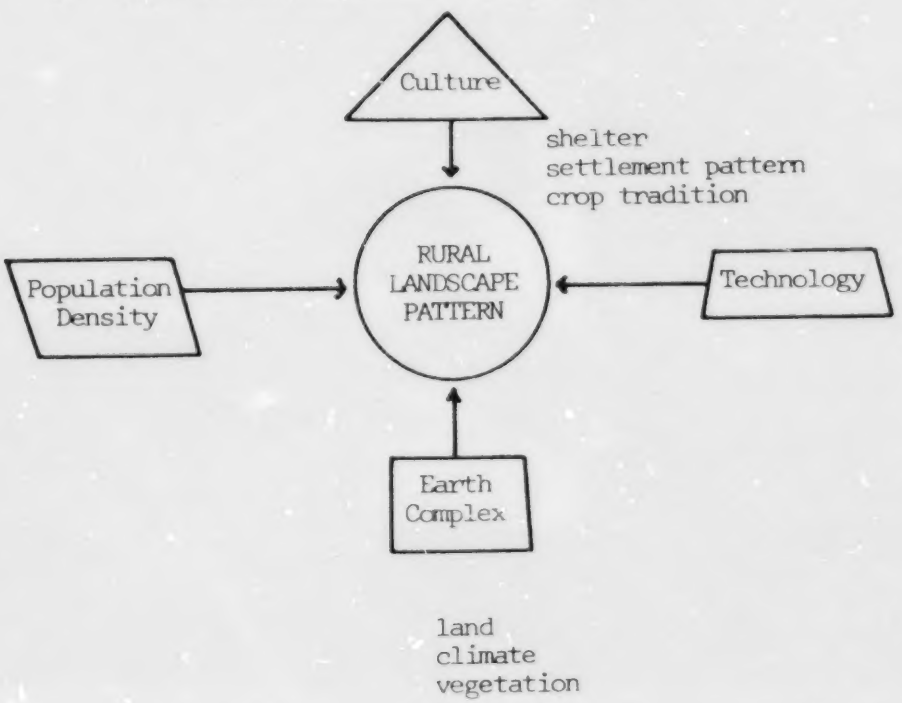
Ideas I Must Explain:

I can explain the three parts of the earth complex: land, climate, vegetation.

I can define culture and give examples that show how culture affects me.

I can explain what a shelter is and can explain how people arrange shelters into different settlement patterns.

Look at the Rural Landscape Model below:



In this activity we shall discuss two of the big ideas in the rural landscape model. These ideas are <u>culture</u> and <u>earth complex</u>.

Earth Complex

The rural landscape is affected by the earth complex. A complex has many parts. The earth complex has three basic parts. They are land, climate, and vegetation. Let us discuss these three parts of the earth complex.

1. Land. Land refers to the shape of the earth's surface. A rural landscape can be flat, hilly, or mountainous. The land in Iowa is flat or slightly hilly. In contrast, the land in Japan is very mountainous. The land in the Netherlands is very flat. The rural landscape in all of these places is affected by the shape of the land.

a. What is the shape of the land where you live?

b. How does the land affect the rural landscape?

2. Climate. Climate refers to temperature and rainfall over long periods. Some places are hot. Others are cold. Some places have heavy rainfall and others have very little. Some places are too dry for farming and others are too wet. Locate the cities of Chicago in the United States and Stanleyville in the Congo (Africa) on a world map. See the data tables below.

Location	Yearly Rainfall	Yearly Temperature
Chicago, Illinois	32 Inches	50°
Stanleyville, Congo	66 Inches	80°

a. What does the ° stand for after the 50 and the 80?

b. Which city above has the warmest climate?

c. Which city has the highest rainfall?

Chicago and Stanleyville have very different climates. Chicago has very cold winters. Crops cannot grow the year round in Chicago because of the winters. Stanleyville has very high rainfall. But Stanleyville has no winter. It is warm all year long. Some crops do not grow where it is hot and wet.

a. Is the climate where you live more like Chicago or Stanleyville?

b. Will crops grow the year round in Stanleyville or in Chicago? Why?

c. Why is there no winter in Stanleyville?

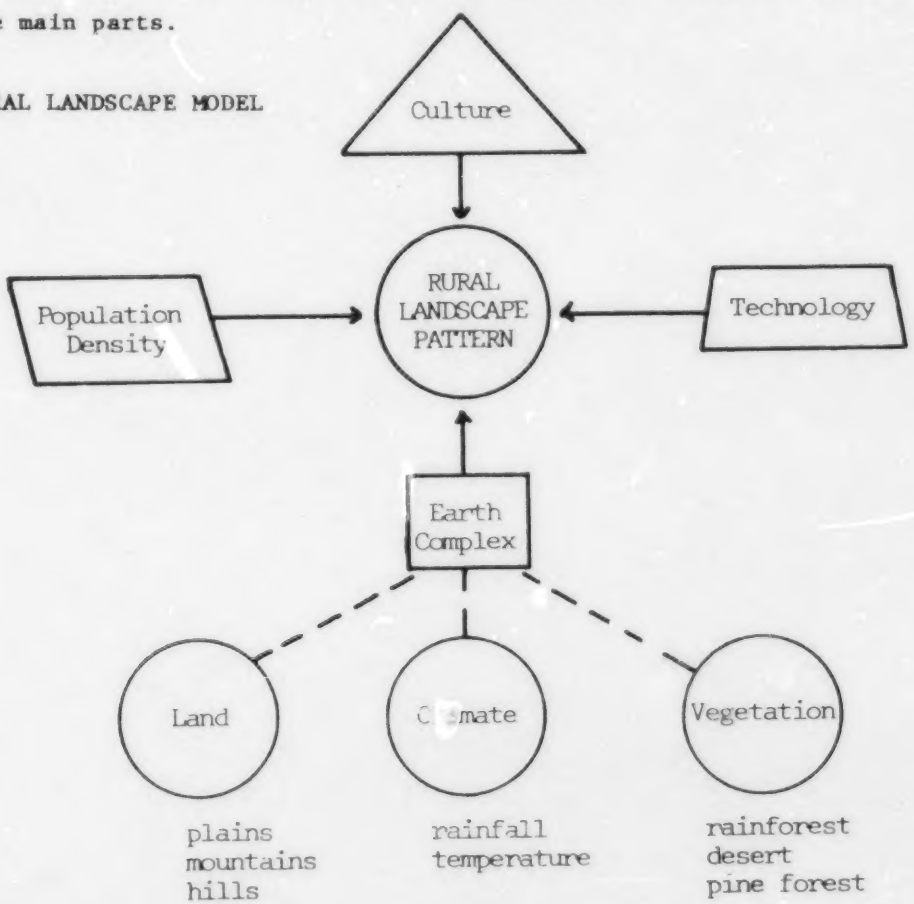
3. Vegetation. Vegetation refers to the plants that grow on the earth. A forested landscape in Japan is not like a desert in Australia where there are very few plants. A rainforest in Africa is not like a piney woods landscape in Georgia.

a. What is vegetation?

b. What is the vegetation pattern where you live. (Do not confuse the natural vegetation with the farm crops?)

The earth complex is one of the four big ideas in the Rural Landscape Model. The diagram below shows the earth complex and its three main parts.

A RURAL LANDSCAPE MODEL



a. What are the three major parts of the earth complex?

b. What are some types of landforms?

c. What are the two elements of climate?

d. What are some different types of vegetation?

Culture

Culture refers to the way people live. The way people eat, the houses they live in, the way they make a living, the language they speak, the way they worship are all part of their way of life, or culture. Children learn the culture from their parents and other people around them. People learn to talk, eat, work, and worship from their culture.

People throughout the world have the same basic needs. All people must eat. But all people do not eat the same foods. All people must have a place to live. But all people do not build their houses alike. All people must speak. But there are many different languages. People in different areas of the world meet their needs in different ways. The different ways people meet their needs make up culture.

Because of cultural and earth complex differences, there are many different rural landscapes across the earth. A rural landscape in Iowa is not like a rural landscape in Japan. A rural landscape in Australia is different from a rural landscape in the Netherlands. The houses are different; the way the fields are laid out is different; roads and bridges do not look the same. The culture of man gives a different landscape to different places.

a. What is culture?

b. What language do you speak? How is language affected by culture?

c. What evidence of language can you see on the landscape? Is language part of the landscape?

d. What evidence of religion can you see on the landscape? Is religion a part of the landscape?

e. Why are there many different cultures in the world?

Culture on the Landscape

We can see three parts of culture on the landscape. They are shelters, settlement pattern, and crop tradition.

1. Shelters. A shelter is a building. Shelters are the basic element in human settlements. Man builds settlements wherever he goes. A house is a shelter. A church is a shelter. A school is a shelter. A barn is a shelter. Any building where people live or work is a shelter.

2. Settlement Pattern. Every settlement has a pattern. Settlement pattern refers to the spacing between shelters, roads, and fences.

A settlement is a group of shelters. A settlement can vary from a few huts in a forest to a big city with tall buildings. A city is a large settlement. A small settlement is a village or town. A farmstead is a very small rural settlement. The diagrams below show three types of settlement pattern.

THREE SETTLEMENT PATTERNS

shelter = •

A
Spread pattern
(farmstead)

B
Village pattern

C
String pattern

a. How does a spread settlement pattern differ from a village pattern?

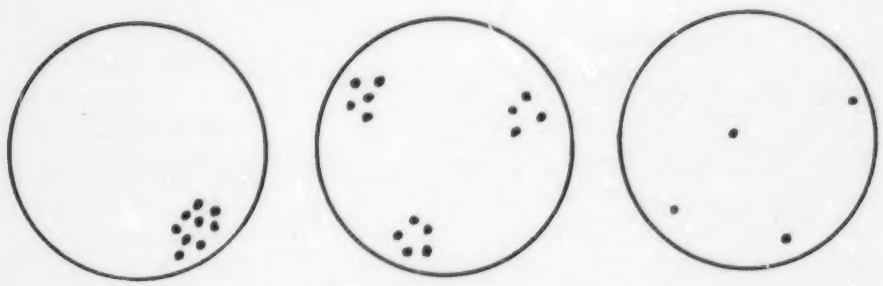
b. How is a string pattern different from a village pattern?

c. How does a shelter differ from a settlement?

Look at the three diagrams below:

SETTLEMENT PATTERN

shelter = •



A B C

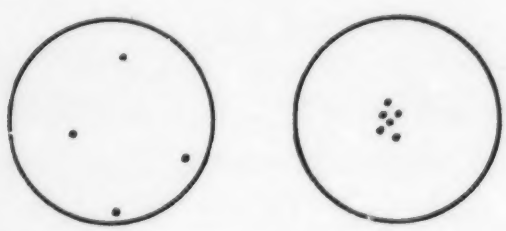
a. Which diagram shows a spread pattern?

b. Which two diagrams show a village pattern?

People from different cultures arrange their rural landscapes into different settlement patterns. In the United States, for example, farmers live in a spread pattern. American farmers live on the land they farm. Japanese farmers, in contrast, tend to live in small villages and walk to their farm plots each day

Pygmies live in villages. Will the Pygmy settlement pattern be more like the settlement pattern in the United States or Japan? Farmers and ranchers in Australia live on farmsteads. Will the settlement pattern in Australia be more like the settlement pattern of the United States or of Japan? See the diagram below.

SETTLEMENT PATTERN



A B

a. Which farm settlement pattern is most common in the United States? In Japan?

3. Crop Tradition. Crop tradition refers to the most important farm crop or group of farm crops in an area. The crop tradition in most of Asia is rice. In the Southeastern United States the crop tradition has been cotton, but that has changed in recent years. The crop tradition in the Midwestern United States is corn.

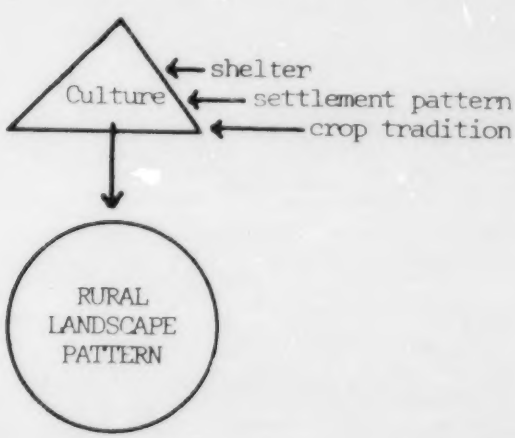
The crop tradition in an area is affected by both the earth complex and the culture. Climate and land rule out the growing of many crops. Some areas are too cold, too hot, too wet, too dry, or too hilly for growing crops. But in areas where crops can be grown, man chooses the crops and animals. Man chooses the crops he will grow, making the crop tradition a part of his culture or way of life.

a. What is the crop tradition where you live?

b. How is the crop tradition affected by the earth complex?

c. How is the crop tradition affected by culture?

Look at the Rural Landscape Model that is below:



a. Which of the four ideas in the Model is shown above?

b. What are the three parts of culture that can be seen on the rural landscape?

c. What are the three types of settlement pattern?

d. How do the earth complex and culture interact to influence the following: shelter, settlement pattern, crop tradition?

C--THE RURAL LANDSCAPE MODEL:
TECHNOLOGY AND POPULATION DENSITY

Terms I Need to Use: power
energy
technology - machine power and muscle power
population density - high density and low density fuel

Ideas I Must Explain:

I can explain what technology is and can give examples.

I can explain how machine power landscapes differ from muscle power landscapes.

I can explain how the population density affects the way the rural landscape is used.

In this activity we shall learn about the other two big ideas in the rural landscape model. Today we shall discuss technology and population density. Remember that the first two big ideas are culture and earth complex.

Technology

Man uses technology to do his work. Technology refers to power, tools, and skills. There are two types of power--muscle power and machine power. Muscle power comes from people and work animals. Some rural landscapes are built with muscle power. Examples of muscle power are plows pulled by oxen, hoes, and digging sticks. Other landscapes are made with machine power, such as bulldozers or tractors. Technology is a part of culture. Some cultures have more advanced technology than others.

a. What is technology?
b. What are the two types of power?
c. Why do we say that technology is part of culture?

There are machine tools and muscle tools. Hand tools such as plows, digging sticks, and hoes are powered by muscle power. With muscle tools, muscle power is applied directly to the tool and then to the land. Your pencil is a muscle tool. When you write, you apply power to the pencil and then to the paper.

Machine tools are powered by a motor. Power is applied to the tool by a motor and man guides the machine. Men only guide machines, they do not power them. Machines get their power from motors which are powered by fuel. Gasoline and coal are two types of fuel. On the other hand, people and animals get their power from food. Muscle power comes from food rather than fuel.

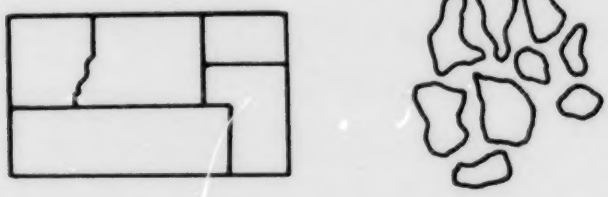
a. Why is a car a machine tool rather than a hand tool?

b. Does man guide a car or power it?

c. Why is a power lawn mower a machine tool rather than a hand tool?

A landscape built with machine power differs from a landscape built with muscle power. Rural landscapes made by machines tend to have straight rows and large fields. Machine power farms usually have large fields because farmers need large spaces to turn around the big machines. Muscle power landscapes have small fields because people and animals cannot do as much work as machines. Muscle power fields often have crooked rows and outlines.

TWO LANDSCAPE PATTERNS



A B

a. Which diagram above shows a machine power landscape?

b. How can you tell that B is probably a muscle power landscape?

c. Why would you expect the land in A to be more flat than in B?

People who operate machine power tools must have more skills than persons who use muscle power tools. A tractor requires more skill to operate than a hoe. Muscle power tools require people or animals for power, not for guidance. In contrast, machine power tools need skilled persons to run them and a supply of fuel energy.

a. Must a person who uses a hoe know how to read?

b. Why must a person who drives a tractor or a bulldozer know how to read?

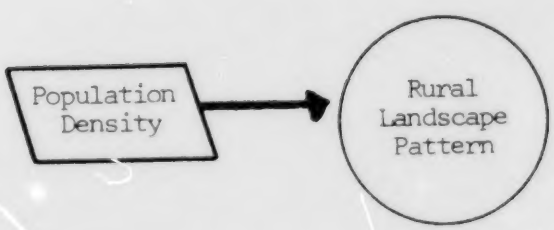
c. Is a tractor easier to repair than a hoe?

Population Density

Population density refers to the number of people per square mile. Population density affects how people use the land. Some rural areas are crowded and others are not. In areas where there are not many people, large areas are often left in forest or swamp. But in rural areas where there are many people per square mile, nearly all the land is used to grow food. A rural landscape with many people on the land--a high population density--is not like a rural area with few people.

We can think of population density in terms of high and low density. Japan and the Netherlands have very high population densities in the rural areas. They have more than 500 people per square mile. In the United States the rural landscapes have very few persons per square mile as compared to Japan. The average population density in the United States is 56. See the diagram below.

POPULATION DENSITY



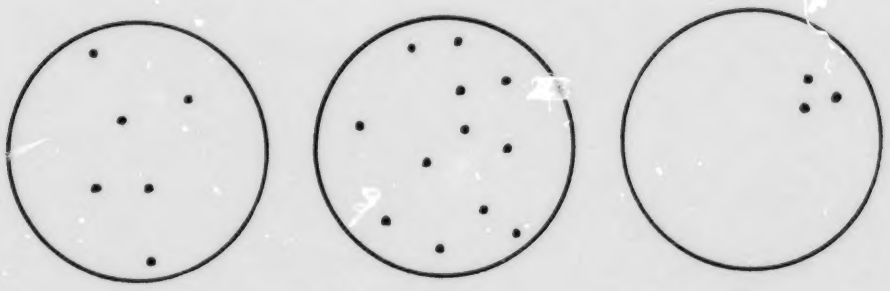
high density
low density

a. What is population density?

b. Is the population density in the United States high or low compared to rural Japan?

See the diagrams below:

POPULATION DENSITY



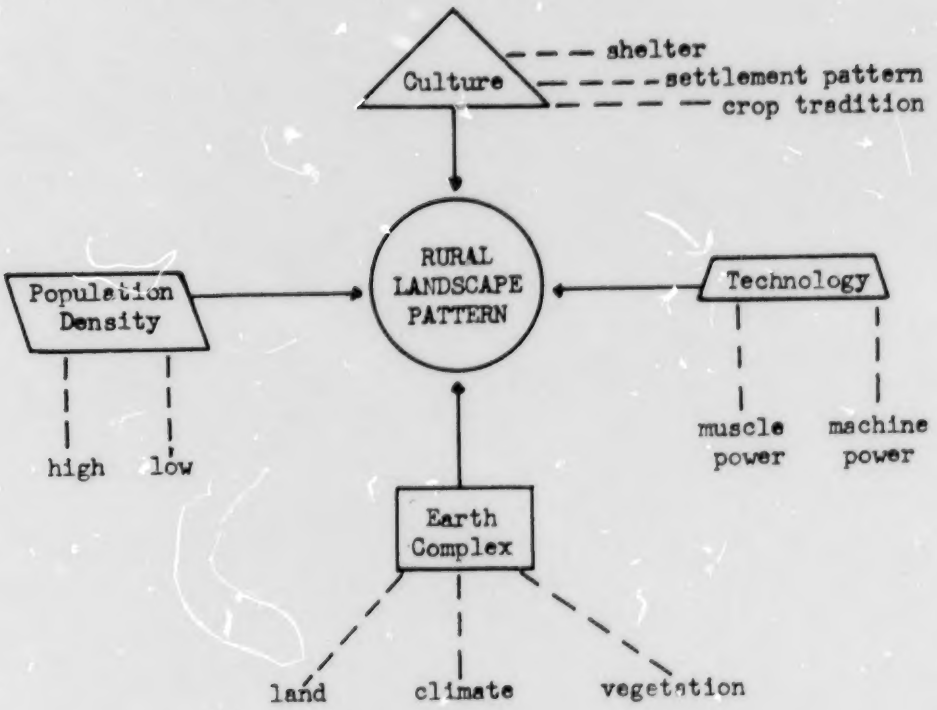
a. If each dot stands for three people, which diagram has the highest population density?

b. Which diagram has the lowest density?

c. Is very much of the rural landscape where you live forested? How is this a clue to the population density? Can a forested landscape feed many people?

d. Is the settlement pattern the same in all three diagrams above? What is the pattern in C?

THE COMPLETED RURAL LANDSCAPE MODEL



a. Can you name the four big ideas in the Rural Landscape Model?

b. What are the sub-ideas of each big idea?

c. Close your book. Can you draw the Rural Landscape Model?

d. Can you explain how the ideas of the Rural Landscape Model affect the rural landscape pattern?

THE FAMILY FARM IN THE UNITED STATES

1

Overview

The family farm is an important part of the culture in the United States. A typical farm in the United States is a family farm. A family farm supports one man and his family.

The family farm is a major part of the rural landscape in the United States. Although the crop tradition varies from region to region, family farms are spread across the landscape in every part of the country. Farming is a special way of life that many city people do not understand.

Family farms in the United States depend on machine power technology. Since the family farm only has a few workers, the farmer must depend on machine power rather than muscle power. Family farms in the United States are modern business operations.

THE FAMILY FARM IN THE UNITED STATES

Terms I Need to Use: family farm
family system/economic system
acre
rural non-farm

Ideas I Must Explain:

I can define a family farm and explain how a family farm is both a family system and an economic system.

I can explain how to set off an area that covers one acre.

I can explain the inverse relationship of farm size and the number of farms within an area.

I can define rural non-farm and can give examples.

The Farm

An area of land that is used for growing crops or livestock (animals) is a farm. A farm is a rural place where people use the earth complex (soil and climate) to grow crops or livestock. A farmer is a person who manages a farm.

Not all farms have both crops and livestock. Many farms grow only crops such as cotton, peanuts, or wheat. Other farms are dairy farms. Dairy farms have dairy cattle, oats, and pastures. Further, there are truck farms and other types of farms. Truck farms grow vegetables for sale in urban centers. The fresh vegetables you buy in the grocery store probably came from truck farms.

The Family Farm

Farms in the United States tend to be family farms. A family farm is a rural place where a man and his family get their living by growing crops and livestock, and selling them. A typical family farm has a house and some other shelters which together make a farm settlement.

A family farm in the United States is a family system and an economic system. A family farm is a family system because one family lives on the farm. The farm house is the central place for the family.

A family is an economic system because the family gets its living from the farm. The farmer and his family grow crops and livestock for sale. They do the farm work themselves and hire little labor from outside the family. Everyone in the family--even children--has a job on the family farm. A family farm is an economic system that depends on the labor of the entire family.

a. How is a family farm both a family system and an economic system?

b. Children who live on a farm have "chores" to do. What are some examples of chores? How are chores related to the family farm?

Size of Farms

An average farm in the United States has 360 acres. One acre is the size of the playing area of a football field. An average city block covers about 3 acres. A 360 acre farm covers more than half of one square mile. Your school probably covers one or two acres.

a. The playing area of a football field is 100 yards long and 50 yards wide. That is one acre. How long would it take one person to cut one acre of grass with a push-type mower?

b. How large is an average farm in the United States?

An average family farm in Japan has 2½ acres. An average farm in the Netherlands has 10 acres. The diagrams below show scale maps (models) of an average farm in three countries. All three farms are family farms. Each farm supports one family. See below.

FARM SIZE IN THREE COUNTRIES

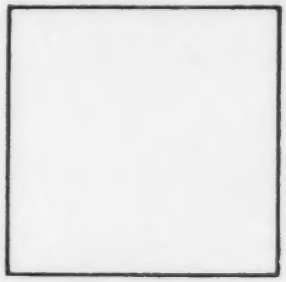
Family farm in Japan

2 1/2 acres

Family farm in the Netherlands

10 acres

Family farm in the United States



360 acres

a. Locate Japan and the Netherlands on a world map. Which country is in Europe? Which country is in Asia?

b. Look at the scale maps above. Which farm is largest? Which farm is smallest?

c. Let us assume that family farms in the United States and family farms in the Netherlands have an average of 5 persons per farm. How many people would a 360 acre family support if it were in the Netherlands and was subdivided into 36 farms with 10 acres each? (Hint: 36 X 10 = ?)

d. Do you think the population density is higher in the Netherlands than it is in the United States?

Rural Non-Farm

Many people in the United States are rural non-farm. A rural non-farm person lives in the country but does not get his living by farming. Rural non-farm people do not farm the land for a living. Most rural non-farm people have jobs in factories or offices in town. They live in the country but drive to town every day.

a. What is rural non-farm?

b. Do people who are rural non-farm depend on farming for a living? Why not?

c. How do rural non-farm people depend on machine power technology such as cars and paved roads?

Farming Is a Way of Life

Farming is more than a way to make a living. It is a way of life. Farmers do not live like city people. Farmers have different working hours than city people. Farmers have different attitudes than city people. Rural or country living is a way of life that many farmers do not want to give up. Many farmers who leave the country and move to the big city do not know what to expect. They are afraid because they do not have the skills to get a good job in the city. They know that housing costs more in the city than in the country. They are afraid because they do not have any friends in the city. Many rural people do not want to live in a crowded high-rise apartment building in a big city. Unfortunately, the rural way of life is changing in the United States. Although many people would prefer to stay in the country and farm, they cannot make a living farming and are forced to move to the city. The rural way of life is changing because many country people are moving to the city.

a. How is life in the city different from life in the country?

b. Why are people who give up farming and move to the big city often afraid of what will happen?

c. Are rural people where you live moving to the city? To what cities are they going?

Think about a typical family farm where you live. Let us describe the farms where you live in terms of the four ideas in the Rural Landscape Model.

Value of Farm Crops in Georgia (1967)	
Crop	Value
peanuts	$92 million
corn	$86
tobacco	$72
cotton	$40

Culture

a. What are the two most important crops in Georgia in value?

b. Which crop is the most important (valuable)?

c. How would you describe the crop tradition in Georgia?

d. Is the rural settlement pattern in Georgia a village pattern or spread pattern?

Earth Complex

a. Is the area where you live flat, hilly, or mountainous? Does this affect the crop tradition? How?

b. What is the climate where you live? Can farmers grow crops the year round? What crops grow in winter? In summer?

c. Is the area forested? Are the forested areas flat or hilly? What is the length of the growing season?

Population Density

a. Are people leaving the farms where you live?

b. Are there rural non-farm people where you live? How do they make a living?

Technology

a. Is the farm work where you live done by machine power or muscle power?

b. Is muscle power (such as horses or mules) used on the farm where you live?

CORN BELT FARMING IN THE UNITED STATES

2

Overview

Corn is the crop tradition in the Midwestern United States. Because corn is the most important farm crop in the farming system, the area is called the Corn Belt. The corn that is grown in the Corn Belt is fed to livestock. The livestock--cattle and hogs--are sold at the market.

Soybeans are becoming an important part of the crop tradition in the Corn Belt. It is possible that the crop tradition in the Corn Belt will change from corn to soybeans. Do you think the area will still be called the Corn Belt if soybeans were the main farm crop?

The area of the Corn Belt is limited by the earth complex. The general boundaries of the Corn Belt are influenced by the climate. The northern edge of the Corn Belt is affected by the growing season. The western boundary is set by the rainfall.

2

CORN BELT FARMING IN THE UNITED STATES

Terms I Need to Use:

Midwest	corn-livestock farm
Corn Belt	cash crop
growing season	soybeans
livestock	field corn/sweet corn

Ideas I Must Explain:

I can name the states of the Midwest and can outline the Midwest on a map of the United States.

I can explain why nearly all the corn in the Corn Belt is fed to livestock.

I can explain how people throughout the United States eat corn form the Corn Belt indirectly as beef, pork, and bacon.

I can explain how the Corn Belt is affected by the landforms and climate.

The Midwest

A typical farm in the United States is in the Midwest. The Midwest is the middle section of the country. Illinois is the central state in the Midwest. Chicago is the major city. Look at the map below.

THE MIDWEST

a. Seven cities are shown as dots in the map above. Identify the cities: Chicago, Detroit, Omaha, St. Louis, Cleveland, Minneapolis, Indianapolis.

b. Be certain that you can name the states where the cities are located.

The Corn Belt

The Corn Belt is the area of the Midwest where corn is the main crop. There are rural landscapes in Iowa, Illinois, and Indiana where one can see corn fields everywhere in the summer. This area is the Corn Belt. Almost half of the total cropland in the Corn Belt is planted in corn. Corn is the crop tradition in the Corn Belt. Almost half of the corn in the United States is grown in the Corn Belt area.

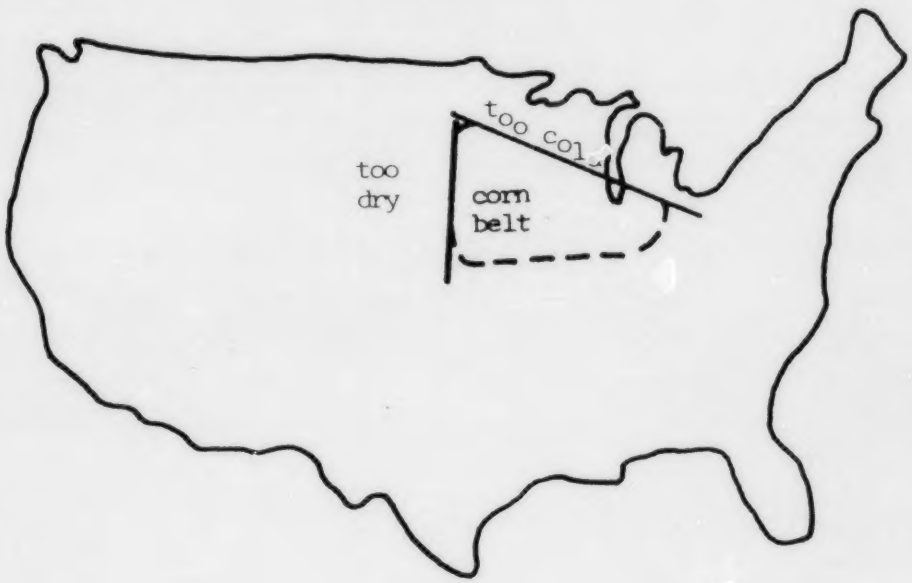
The Earth Complex in the Corn Belt

Two boundaries of the Corn Belt are set by the earth complex. The northern boundary of the Corn Belt is affected by the growing season. Growing season refers to the average number of summer days between the last frost of the spring and the first frost of the fall. Corn requires a growing season of at least 120 days. The growing season to the north of the Corn Belt is not long enough for corn to ripen before the first frost in September or October.

The western boundary of the Corn Belt is influenced by the amount of rainfall. Corn needs at least 25 inches of rainfall per year. The area west of the Corn Belt receives less than enough rain to grow corn. In these drier areas the crop tradition changes from corn to wheat, barley, sorghum, and millet.

The map below shows the Corn Belt. The Corn Belt is part of the Midwest. Notice the two boundaries that are closely related to the earth complex. See the map below.

THE CORN BELT



a. What is the Corn Belt? Where is it in relation to the Midwest? Is it larger or smaller than the Midwest?

b. What two elements of the earth complex limit the area of the Corn Belt?

c. Do you live in the Corn Belt? Is the earth complex where you live suitable for growing corn? How do you know?

Corn-Livestock Farms

Farms in the Midwest tend to be corn-livestock farms. The farmers grow corn and feed it to livestock--cattle, hogs, and poultry. About three-fourths of the corn grown in the Corn Belt is fed directly to livestock. In the Corn Belt the corn and livestock are interdependent. The corn is fed to the livestock, and the livestock depend on the corn.

Do not confuse field corn and sweet corn. Sweet corn is usually grown in gardens. Most of the corn you eat is sweet corn and does not come from the Corn Belt. The corn that grows in the Corn Belt is field corn. Field corn is fed to livestock. People eat field corn indirectly as beef, pork, and bacon.

Corn is not the only farm crop that is grown in the Corn Belt. Some of the other crops are oats, wheat, alfalfa, and soybeans. Soybeans are becoming very important in the Corn Belt. They are used in margarine, mayonnaise, vegetable oil, and dairy substitutes such as soft ice cream. Soybeans are taking up more and more cropland in the Corn Belt. It is possible that soybeans could replace corn as the major crop in the Corn Belt.

Soybeans are a very important cash crop in the Corn Belt. A cash crop is a crop that is sold for money. Wheat and soybeans are cash crops. Corn is usually not a cash crop because it is fed to livestock on the farm where it is grown. Soybeans bring a high price per bushel because they have many different uses.

a. What is a corn-livestock farm?

b. How does sweet corn differ from field corn?

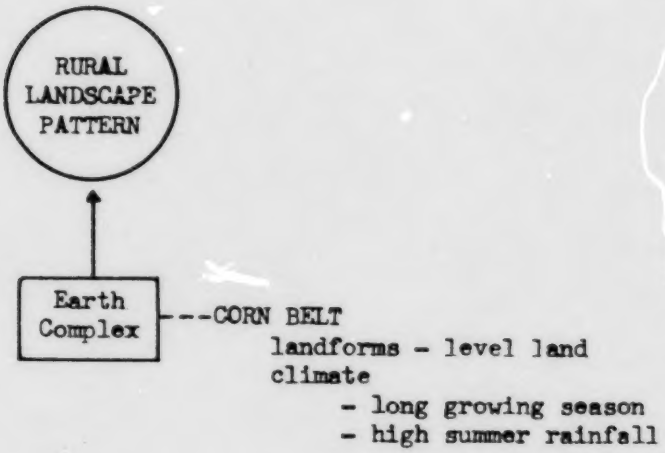
c. What happens to most of the corn in the Corn Belt?

d. What are some of the uses for soybeans? Do you think the many uses for soybeans are related to their high market price?

e. What is a cash crop? Why is it that most corn in the Corn Belt is not a cash crop?

f. Do you think the area would still be called the Corn Belt if soybeans were the main crop?

RURAL LANDSCAPE MODEL



a. Which of the four ideas in the Rural Landscape Model is shown above?

b. Can you describe the landforms in the Corn Belt? Why are the landforms in the Corn Belt very suitable for machine power farming?

c. According to the model above, what two elements of the climate are important for growing corn?

d. Why is the growing season very important for growing corn? Is the growing season more than 120 days where you live?

e. Is there enough rain in the summer for growing corn where you live?

A CORN BELT FARM IN IOWA

3

Overview

There is a common settlement pattern in the rural Corn Belt. Farms in Iowa tend to be large family farms. Each farm covers about one-half square mile or 360 acres. The farmer lives on the farmstead in a house near a main road. Each farm house is from one-fourth to one-half a mile from the nearest neighbor. Children from family farms ride a school bus into town.

Corn and livestock are interdependent on corn-livestock farms in the Corn Belt. The corn is fed to the livestock and the livestock depend on the corn. Corn is the crop tradition in the Corn Belt.

The earth complex in the Corn Belt is almost perfect for growing corn. Corn Belt soils are some of the best soils in the world. Corn Belt farmers are careful to protect their good soils. They work to prevent soil erosion. They also use crop rotation to keep the soils rich. Corn Belt farmers use chemical fertilizers to help them get some of the highest yields per acre in the world.

A CORN BELT FARM IN IOWA

Terms I Need to Use: silo
corn-livestock farm
topsoil
soil erosion
humus
crop rotation

Ideas I Must Explain:

I can draw a sketch map of the crop pattern on a Corn Belt family farm.

I can explain why Corn Belt farmers feed their crops (corn, oats) when the price of livestock is high and sell the crops when livestock prices are low.

I can explain why Corn Belt farmers are very careful to prevent soil erosion and to build up the soil by crop rotation.

An average farm in the Midwest is a family farm with 360 acres. Corn is the most important crop. More than half of the farms grow corn as the major crop. From a 360 acre farm the farmer grows corn, feeds it to livestock, and sells the livestock. He also grows cash crops such as wheat and soybeans for sale. The family farmer can then send his children to college and buy a new car every year or two.

a. What is a corn-livestock farm?

b. Where does the corn you eat as a vegetable come from? Is it field corn or garden corn? How does a farmer sell his field corn?

c. Why are soybeans becoming an important cash crop? Are soybeans grown where you live?

The Pattern on a Corn-Livestock Farm

In this activity we shall study the crop and livestock pattern on an average Corn Belt farm. The farm we shall discuss is an average 360 acre family farm in Iowa. Find Iowa on a map.

In an average year the 360 acres of this farm are used as follows:

corn	210 acres
oats	40 acres
pasture	30 acres
soybeans	70 acres
buildings & roads	10 acres
TOTAL	360 acres

The farm also has the following livestock:

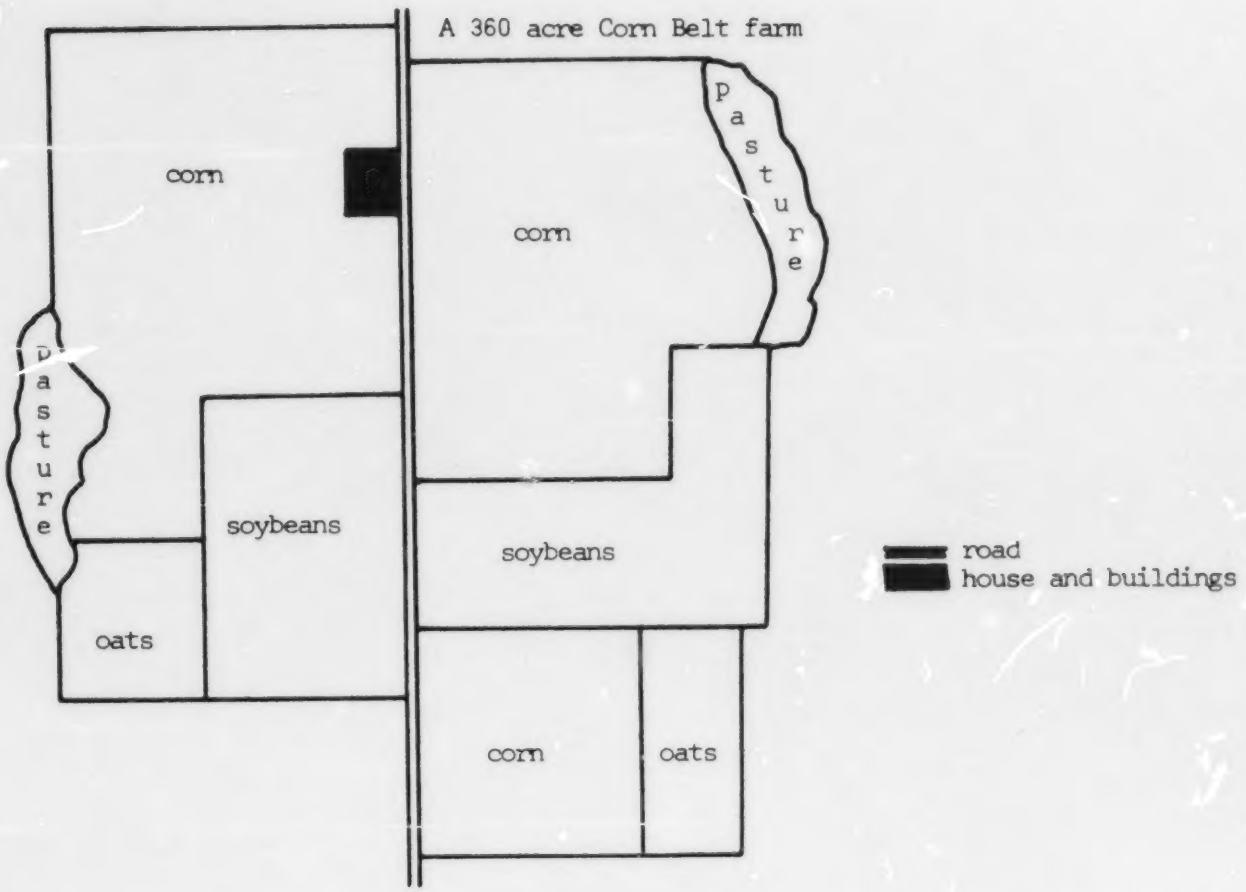
160 hogs
50 cattle (beef)
50 chickens (summer only)

Notice that although the above farm only has 160 hogs at one time, it can sell more than 400 hogs per year. This is possible because pigs have two litters per year and some litters have 15 piglets each.

a. What crop has the most acres? What crop is second? Does this tell us why we call the area the Corn Belt?

b. How can a farm that only has 160 hogs at one time sell 400 hogs per year?

Below is a map of the farm.



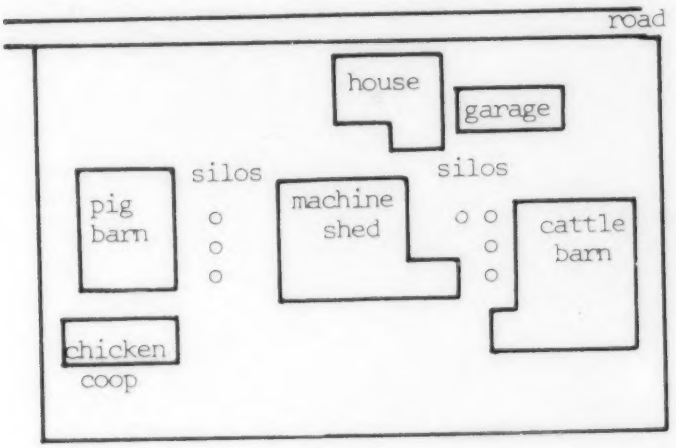
a. Look at the map above. What two crops cover the most area? What is the crop tradition?

b. Notice the two pasture areas. These are areas that are sloped or are too wet for field crops. What is the land like in the other areas of cropland? Do you think the corn fields and the soybean fields are flat or hilly?

c. Can corn pickers and other big machines be used on steeply sloped land? Why not?

The map below shows the house and other buildings on the farm.

A MAP OF THE HOUSE AND FARMYARD



a. Notice the house where the farmer and his family live. The next closest house is one-fourth mile down the road. How do the children get to school?

b. Is the settlement pattern of Corn Belt farms a spread pattern or a village pattern?

c. Notice the silos. A <u>silo</u> is a tall, round storage bin where silage (ground up corn and cornstalks) is stored in the winter. Silage is fed to the livestock.

Soybeans are the most important cash crop in the Corn Belt of the Middle West. Soybeans have a high sale price, are easy to grow, and help make the soil rich in humus. <u>Humus</u> is the decayed plant material that gives the soils in the Corn Belt a deep black color. Soils with much humus are the best soils for growing crops.

a. Why are soybeans a very popular crop in the Corn Belt?

b. What is humus? Why do farmers want a lot of humus in their soils?

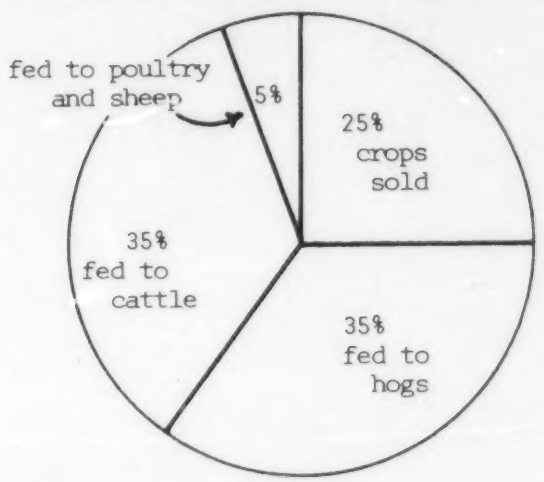
Some years the market price of livestock (hogs and cattle) is very low. In these years the Corn Belt farmer will often sell part of the corn and oats he grows rather than feed them to his livestock. In an average year, however, the farmer will feed everything he grows but the soybeans. He feeds the corn and oats to his hogs and cattle, and then sells the livestock. Corn and livestock are <u>interdependent</u>. The livestock depend on the corn.

a. How can the Corn Belt farmer make more money by changing the corn and oats into pork and beef than he can by selling the crops directly?

b. Why does he sell the corn and oats when the market price of livestock is low?

The pie chart below shows what happens to the crops on a typical corn-livestock farm in the Corn Belt.

USE OF CROPS ON FARMS WITH LIVESTOCK



a. What percentage of the total crops are sold as cash crops?

b. How are most of the crops used?

c. What are poultry?

d. If the prices for livestock are very low, why would the 25% that is sold for cash crops <u>increase</u>?

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Earth Complex

The Corn Belt is the richest farm region in the world. The Corn Belt has a very favorable earth complex for farming. We have already learned that the Corn Belt has long, hot, wet summers which are good for growing corn. The land is flat or nearly flat. But more importantly, the Corn Belt has the best soils in the world. Corn Belt soils are deep and have humus. Humus gives the Corn Belt soils their deep black color.

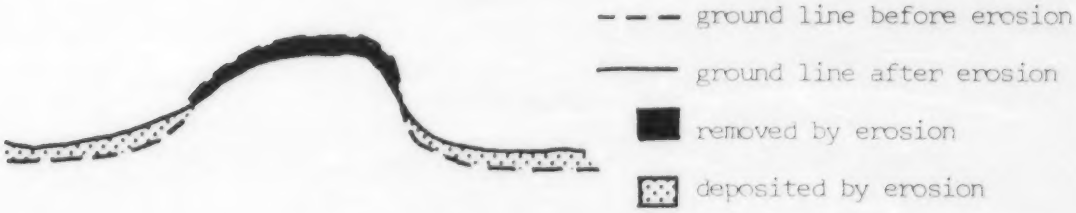
a. What factors make the Corn Belt the richest farming area in the world?

b. Why are the soils in the Corn Belt so good for farming?

c. Are the soils black where you live? How is soil color a clue to the amount of humus?

Farmers in the Corn Belt take special care to prevent soil erosion. Soil erosion is the washing or blowing away of the topsoil. Topsoil is the rich soil on the earth's surface where crops grow. Soil erosion is caused by water and wind, especially water. The diagram below shows what happens when there is soil erosion.

SOIL EROSION



a. What is soil erosion? Why is it bad for farmers?

b. Can topsoil be replaced after it is removed? Why not?

Crop Rotation

Corn Belt farmers plan ahead to prevent draining the soil of its natural fertilizer by planting the same crop year after year. They rotate their crops because soybeans replace in the soil what corn takes out. Crop rotation refers to the growing of different crops in one field. Two common rotation patterns in the Corn Belt are corn-corn-oats and corn-corn-soybeans. For example, corn is grown in one field the first year; corn is grown in the field the second year; but oats are grown the third year. The diagram below shows how crop rotation works.

Cycle A--corn-corn-oats

	Field 1	Field 2	Field 3
1st Year	corn	corn	oats
2nd Year	corn	oats	corn
3rd Year			

Cycle B--corn-corn-soybeans

	Field 1	Field 2	Field 3
1st Year	soybeans	corn	corn
2nd Year	corn	soybeans	corn
3rd Year			

a. What is crop rotation?

b. How does crop rotation help the soils?

c. Look at the diagrams above. Can you fill in the crops for the third year?

d. Notice the two rotation cycles (A and B). Why would you expect to find more livestock on farms that use the corn-corn-oats cycle than on those with the corn-corn-soybeans cycle?

RURAL LANDSCAPE MODEL

Corn Belt farms
settlement pattern - spread pattern
crop tradition - corn and soybeans
type of farm - corn-livestock farm

Corn Belt soils
crop rotation
fertilizer

a. What two ideas of the Rural Landscape Model are shown above?

b. What is the settlement pattern in the Corn Belt?

c. What is the crop tradition in the Corn Belt?

d. What is a corn-livestock farm?

e. How are corn and livestock interdependent in the Corn Belt?

f. What are two ways that Corn Belt farmers keep their soils fertile?

TECHNOLOGY AND THE RISE OF CORPORATION FARMS IN THE UNITED STATES

4

Overview

Corn Belt farmers use modern technology in their farming. Some examples of this technology are hybrid corn, chemical fertilizers, and all types of power machinery. The new methods of technology are very costly, but they increase yields and decrease the cost per bushel.

In the last few years there has been a growth of corporation farms in the United States. Since corporation farms can gather great sums of money together, they are able to buy modern technology. It is not as difficult for a big corporation farm to buy the new machinery and fertilizer as it is for a small family farm to buy it. Many of the foods you buy come from big corporation farms.

TECHNOLOGY AND THE RISE OF CORPORATION FARMS
IN THE UNITED STATES

Terms I Need to Use: hybrid corn
chemical fertilizer
corporation farm

Ideas I Must Explain:

I can explain how hybrid corn differs from regular corn.

I can explain that the number of farmers is decreasing in the United States and can give reasons for this.

I can explain why the large farms are becoming more important and small farms are becoming less important.

I can explain what a corporation farm is and how it differs from the family farm.

We have learned that technology refers to power, machines, and human skills. Changes in technology affect the rural landscape. Large fields and power machines are interdependent. Big machines require large, flat or nearly flat fields. And, large flat fields are best farmed with big machines.

Three Technologies

Modern technology affects the rural landscapes in the Corn Belt. Three new technologies are especially important. They are: hybrid corn, chemical fertilizers, and power machinery. Let us discuss each of these new technologies.

1. Hybrid corn. Hybrid corn is a special type of corn that was developed by scientists in a laboratory. Hybrid corn was developed for its specific traits. It grows fast and resists disease and insects. Hybrids are well suited to machine pickers because they grow straight and tall. Nearly all the field corn in the Corn Belt is hybrid corn. Hybrid corn increases yields per acre by as much as 50% in the Corn Belt.

a. How is hybrid corn related to technology?

b. Is hybrid corn grown where you live?

2. Chemical Fertilizers. Chemical fertilizers are made up of various plant foods. They have largely replaced animal fertilizers in the Corn Belt. Farmers are using more and more chemical fertilizers to enrich the soils because high-yield crops such as hybrid corn and soybeans drain plant foods from the soil. More chemical fertilizer is used to grow corn than any other crop in the United States. Like hybrid corn, the use of chemical fertilizer has helped to increase corn yields greatly.

The table below shows corn yields in bushels for 5 different periods. Study the table below.

Corn Yields in the United States
(in bushels per acre)

Year	Bushels per Acre
1930	21 bushels
1940	29
1950	38
1960	55
1970	75

a. Have corn yields increased or decreased from 1930 to 1970?

b. How much have corn yields increased from 1930 to 1970? Can you express the increase in percentages?

c. What two factors affected this increase in yields per acre? How are these factors related to technology?

d. Do you think that corn yields will continue to increase?

e. Why do farmers who plant hybrid corn also use large amounts of chemical fertilizer?

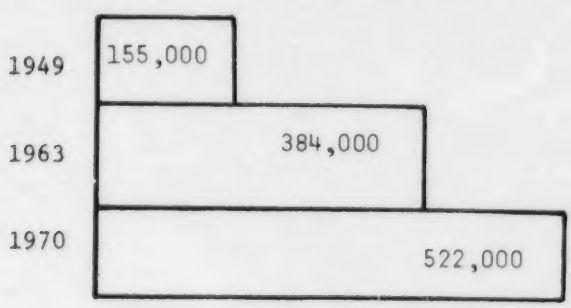
f. Do farmers use chemical fertilizers where you live?

3. Power Machinery. Power machines such as tractors, grain combines, and hay bailers need very large fields. Big machines cannot operate well in small fields. Farmers need to have long rows so they can spend much time working and little time turning around the big machines.

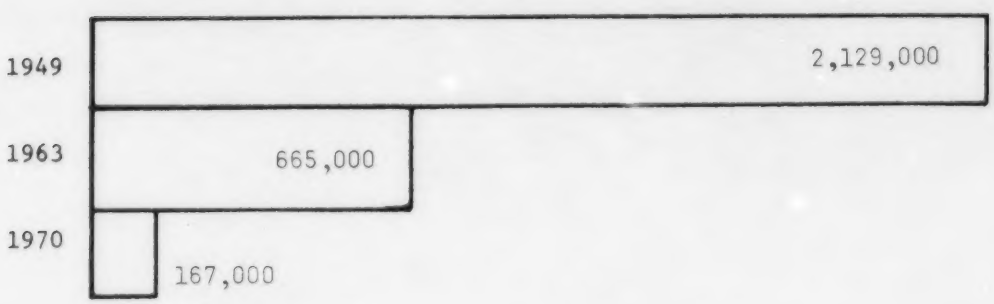
a. How has power machinery affected the rural landscape?

b. Why are large fields more efficient than small fields for power machines?

FARMS WITH ANNUAL SALES OVER $20,000



FARMS WITH ANNUAL SALES OF $50-5,000



a. Which graph (A or B) describes the largest farms?

b. What is the trend in the farms with annual sales of more than $20,000?

c. What is the trend in the farms with annual sales of $50-5000?

d. What is happening to the farms in graph B? Is this related to techonology? How?

e. Can you make a generalization about the number of small and large farms based on the two graphs above?

Corporation Farms

Corporation farms are becoming important in the United States. A corporation farm is a farm that is owned by people who buy shares of stock in a farm company. Corporation farms tend to be very large. Many corporation farms have thousands of acres and hundreds of workers. Further, many corporation farms process the food they grow. Foods such as frozen potatoes and frozen vegetables usually come from corporation farms. Thus many corporation farms are not only farms, but they are factories, also. Some examples of really huge corporation farms are Seabrook Farms in New Jersey, Del Monte in California, and Green Giant.

a. Why is it that many of the people who work for corporation farms actually work in food processing plants?

b. Are there any corporation farms where you live? Do you know anyone who works on a farm or in a factory that is owned by a corporation farm?

c. When you are in a grocery store, look for the trademark of Seabrook, Del Monte, and Green Giant.

Both corporation farms and big family farms use machine power. The workers on a corporation farm are paid wages. Labor costs on a corporation farm are higher than on a family farm because the family members are not paid on family farms. Corporation farms have many specialized machines and workers who are trained to operate them. Some examples of highly specialized farm machines are lettuce and tomato harvesters, grain combines, and cotton pickers.

a. Are all the workers on a family farm paid? Why not?

b. Why do corporation farms tend to use more machines than family farms?

Three Types of Farms

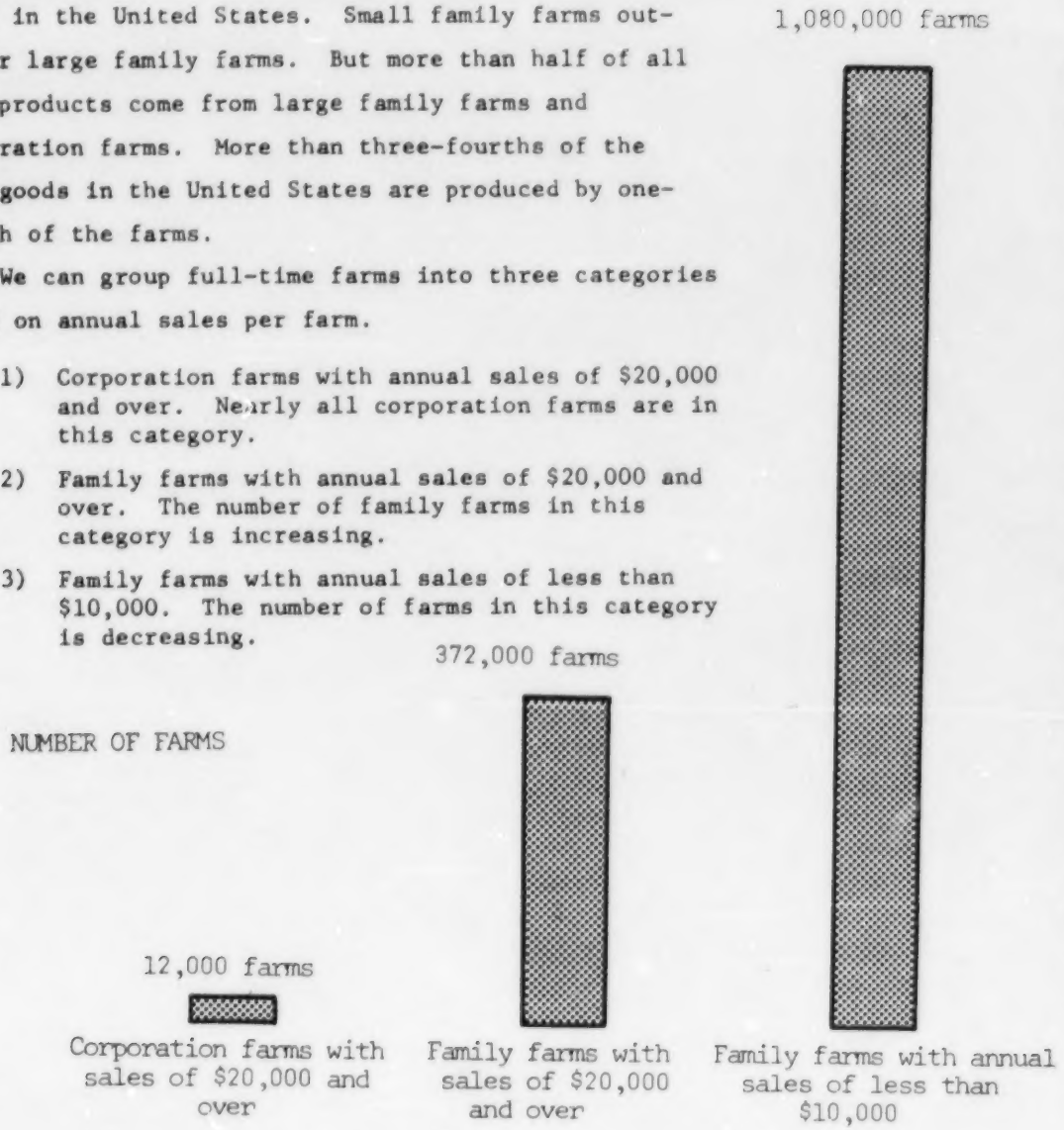
There are more family farms than corporation farms in the United States. Small family farms outnumber large family farms. But more than half of all farm products come from large family farms and corporation farms. More than three-fourths of the farm goods in the United States are produced by one-fourth of the farms.

We can group full-time farms into three categories based on annual sales per farm.

1) Corporation farms with annual sales of $20,000 and over. Nearly all corporation farms are in this category.

2) Family farms with annual sales of $20,000 and over. The number of family farms in this category is increasing.

3) Family farms with annual sales of less than $10,000. The number of farms in this category is decreasing.


1,080,000 farms
372,000 farms
NUMBER OF FARMS
12,000 farms
Corporation farms with sales of $20,000 and over
Family farms with sales of $20,000 and over
Family farms with annual sales of less than $10,000

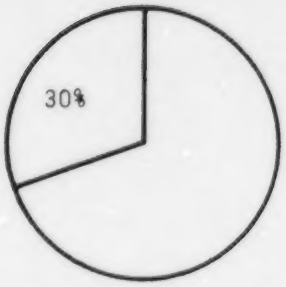
a. What are the three categories of farms?

b. Which category is made up of corporation farms? Which is made up of large family farms? Do large family farms or small family farms have the largest average annual sales?

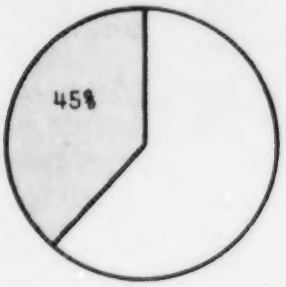
c. Look at the graphs above. Which category has the fewest number of farms? Are there more small family farms or more large family farms? Are most farms in the United States small family farms, or corporation farms, or large family farms? Why is the trend from small family farms to large family farms and corporation farms?

The pie graphs below show the Percentage of Sales of Farm Products for the three categories. See below.

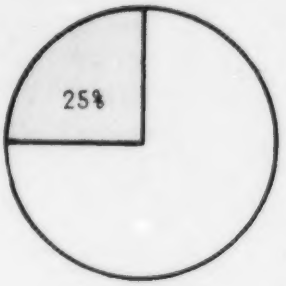
PERCENTAGE OF SALES
OF FARM PRODUCTS (1968)



Corporation farms



Family farms with sales over $20,000



Family farms with sales less than $10,000

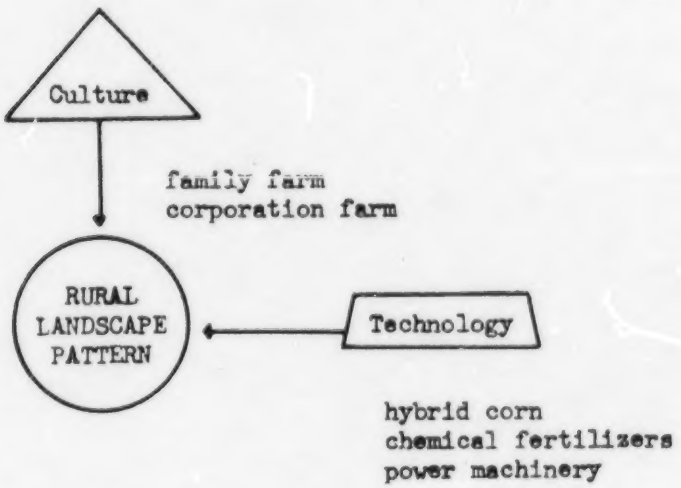
a. Which type of farm grows the largest percentage of crops? Which type grows the smallest percentage of crops? Are small family farms as productive as their numbers would suggest? Why not?

b. What percentage of farm crops comes from corporation farms? Are corporation farms more productive than their numbers would suggest? Why?

c. When you buy food at the grocery story was it probably grown on a <u>small</u> family farm or a <u>big</u> family or corporation farm?

Study the model below.

RURAL LANDSCAPE MODEL



a. Which two ideas of the Rural Landscape Model are shown above?

b. Are there more family farms or corporation farms in the United States?

c. What are some of the advantages of the corporation farms?

d. What is hybrid corn? Why is hybrid corn seed very expensive?

e. How do hybrid corn and chemical fertilizers increase yields?

f. How are power machinery and big fields interdependent?

RECENT FARM TRENDS
IN THE UNITED STATES

5

Overview

Farming is changing in the United States, and these changes are affected by technology. The increased use of costly farm machinery is resulting in farm consolidation. Big farm machines such as tractors and corn harvesters require very large fields. A farmer must have a big farm--hundreds of acres--to pay for the machinery, seed, and fertilizer that he needs.

Farms are becoming larger in the United States, but rural population density is decreasing. Many of the people who leave farming are going to the city to live. Both the number of farms and the number of farmers is decreasing

Another farm trend in the United States is for farmers to live in town rather than on the farmstead. Paved roads and modern cars and trucks make it possible for farmers to drive from their home in town to the farm in a few minutes. "City farmers" depend on modern technology.

RECENT FARM TRENDS IN THE UNITED STATES

Terms I Need to Use: farm consolidation
mechanization
mixed farm
specialized farm
cash crop

Ideas I Must Explain:

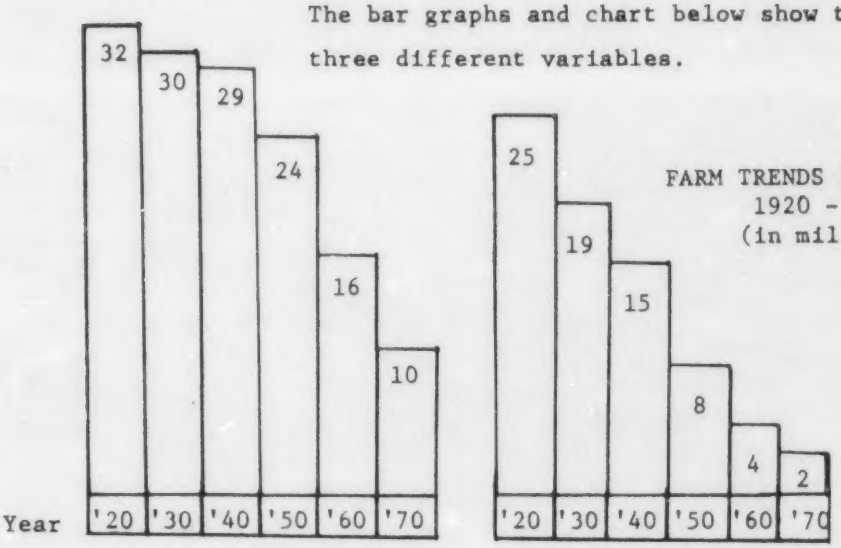
I can define mechanization and explain why it encourages consolidation and specialization.

I can define farm consolidation and explain how it is related to technology.

I can explain how farm consolidation affects the rural population density.

I can define a commercial farm and explain why most commercial farms are specialized farms rather than mixed farms.

The bar graphs and chart below show the trend for three different variables.

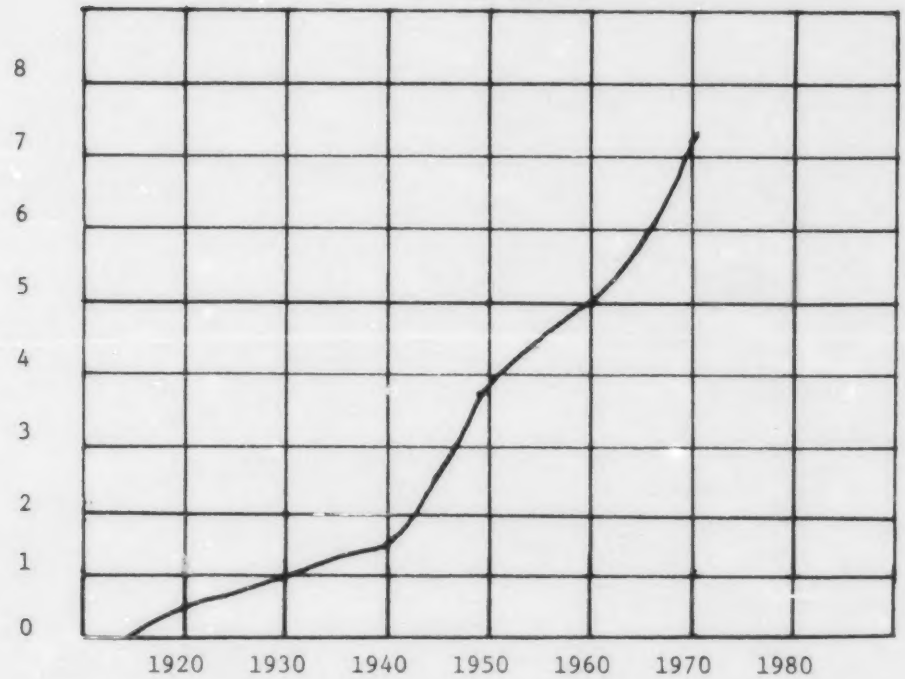


FARM TRENDS IN THE U.S.
1920 - 1970
(in millions)

A Farm Population in the U.S.

B Horses and Mules in the U.S.

C--NUMBER OF TRACTORS IN U.S. 1920 - 1970
(in millions)



a. What variables are shown in graphs A and B? What is the trend in the two graphs?

b. What variable in shown in chart C? What is the trend in C?

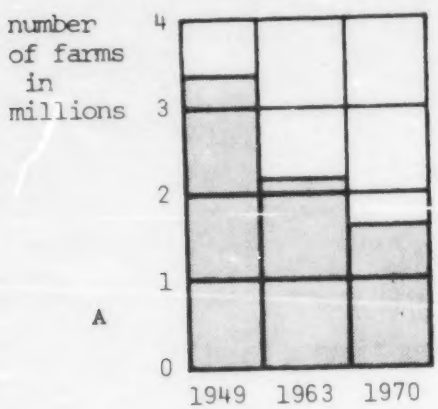
c. Why are there more and more farm tractors while the number of farmers and horses and mules is decreasing?

The number of acres per farm is changing in the United States. Family farms are not the same size as they were a few years ago. The data table below shows the number of farms and the average number of acres per farm for three different years.

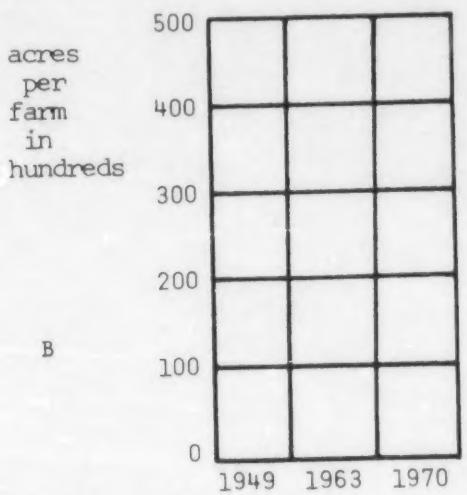
Number of farms and acres per farm for farms in the United States is shown below:

Year	Number of Farms	Acres per Farm
1949	3.4 million	250 acres
1963	2.3 million	350 acres
1970	1.6 million	400 acres

The two graphs below show the data in the graph above. Study Graph A and see the trend. In Graph A are the number of farms in the United States increasing or decreasing? Now complete Graph B using the data in the table above.



A



B

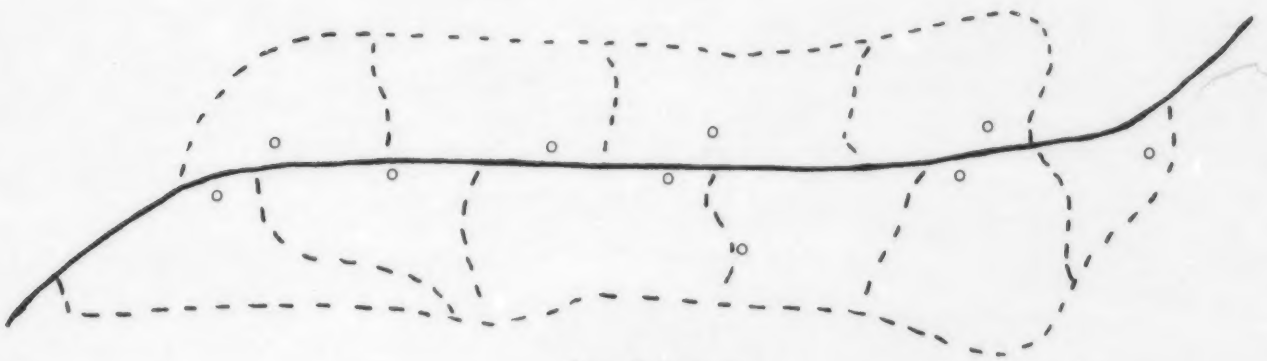
a. What is the trend in the number of farms (Graph A) in the United States from 1949 to 1970?

b. What is the trend in the acres per farm (Graph B in the United States from 1949 to 1970? (Be sure to complete Graph B.)

c. When the number of farms decreases, what happens to the average farm size? Does the acreage increase or decrease? Is the farm population of the United States increasing or decreasing?

The map below shows some family farms along a road. Each farm has a house where the farmer and his family live on the farmstead. See below.

FAMILY FARMS BEFORE CONSOLIDATION



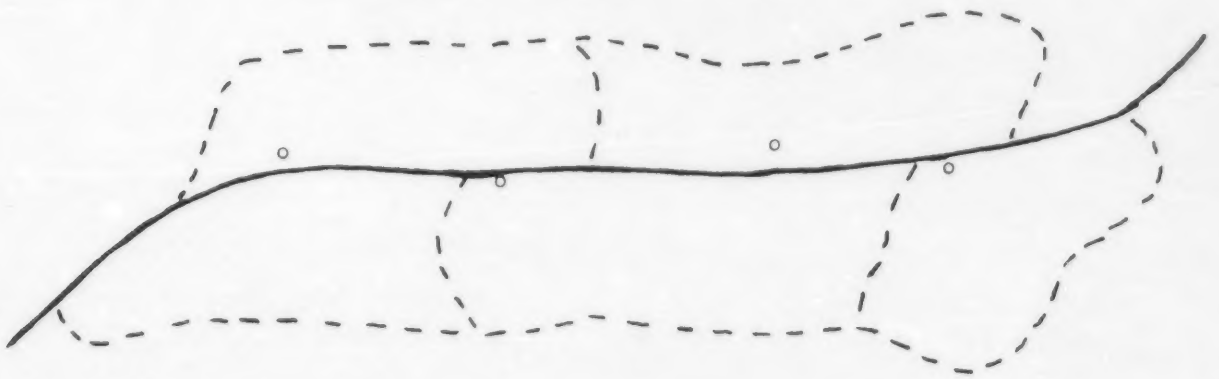
farm house = o
road = ———
farm boundaries = - - - -

a. How many farms are in the map above?

b. How many people live in the area of the map if 3 persons live in each house?

The map below shows the same area after consolidation. See below.

FAMILY FARMS AFTER CONSOLIDATION



a. How many farms are in the map after consolidation? How many people are there if each house has 3 people? Is this more or less people than before consolidation? What has happened to the population density?

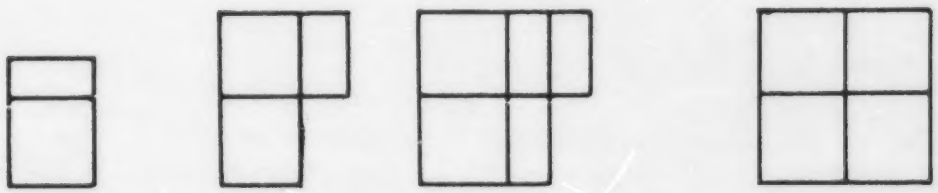
b. Are the farms larger or smaller after consolidation? Would you expect to find more or less machinery after consolidation?

c. Are the farms still family farms?

There are some general trends in the American farm pattern. Each trend affects the geographic pattern of the rural landscape. Let us discuss four of these trends separately:

1. The trend from small farms to big farms. We have already learned that the average farm size in the United States is increasing. Farms are getting bigger because of mechanization and consolidation. See the diagrams below.

AVERAGE FARM SIZE IN THE UNITED STATES



150 acres
1935

250 acres
1949

350 acres
1963

400 acres
1975

a. How has farm size changed from 1935 to 1970?

b. How does farm mechanization differ from farm consolidation?

c. How has mechanization affected consolidation?

d. Do you think farms will continue to increase in acres in the United States? Why?

2. The trend from mixed farms to specialized farms. The family farm is changing from a mixed farm to a specialized farm. A mixed farm grows many different crops. For example, a mixed farm in the South could grow cotton and peanuts for sale. It may also grow corn, oats, and barley for use on the farm as feed for the animals. A mixed farm has many different crops and livestock.

The trend is toward specialized commercial farms. A specialized commercial farm grows only a few crops and sells them--it specializes. Since work animals have been replaced by machine power, there is no need to grow feed crops. A modern commercial farm in the South may grow only two crops--cotton and soybeans. Both of these crops are sold for cash.

One reason for growing only one or two crops on a commercial farm is the high cost of machinery. Since each crop requires special machinery, it is less costly to grow a few crops and to buy only one or two special machines.

a. How does a mixed farm differ from a specialized farm?

b. How has mechanization affected the trend toward specialized commercial farms?

3. The trend from living on the farmstead in the country to living in town. Some farmers are moving from the farm into town. They still farm the land, but they do not live on the rural farmstead. Farmers who live in town drive to the farm each day. They depend on paved roads, cars, and trucks. The families of farmers who live in town do not have chores.

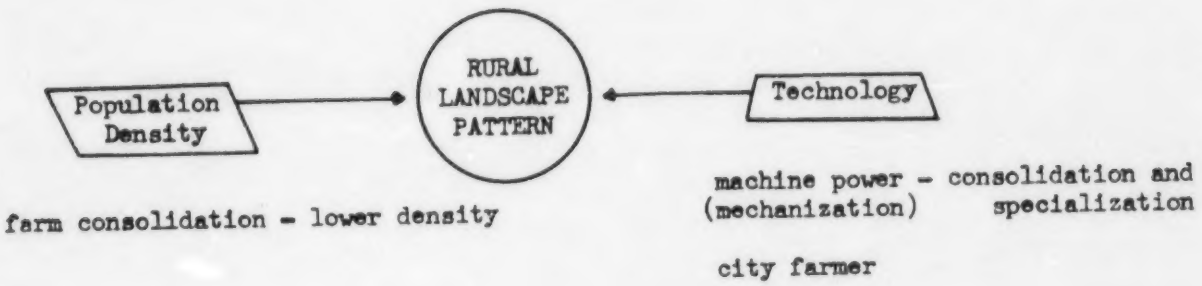
a. How are farmers who live in town dependent on modern technology?

b. What happens to the population density in the rural areas when some people leave farming and others move into town?

c. Is the rural population density increasing or decreasing where you live?

Study the model below.

RURAL LANDSCAPE MODEL



a. What two ideas of the Rural Landscape Model are shown above?

b. What are two results of the increase in machine power (mechanization) on farms in the United States?

c. What is farm consolidation? What happens to the rural population density when farm consolidation occurs?

d. How does mechanization encourage farm specialization?

e. What is a "city farmer"? How does the city farmer depend on machine power technology?

THE NETHERLANDS:
HIGH POPULATION DENSITY AND INTENSIVE RURAL LAND USE

6

Overview

The Netherlands is a very small country in western Europe. The Netherlands covers an area that is probably smaller than the area of your state. The population density in the Netherlands is one of the highest in western Europe, and in the world. The rural landscape in the Netherlands is greatly affected by the high population density.

Farming in the Netherlands is very intensive. Almost three-fourths of the total land area in the Netherlands is used for cropland. Dutch farms are very small compared to farms in the United States.

THE NETHERLANDS:
HIGH POPULATION DENSITY AND INTENSIVE RURAL LAND USE

Terms I Need to Use:
- arable land
- location
- intensive land use
- high population density
- industrial area
- West Germany
- urban
- Dutch
- cropland

Ideas I Must Explain:

I can explain that the Netherlands is a small country at the mouth of the Rhine River in western Europe.

I can explain how intensive rural land use in the Netherlands is related to high population density.

I can define intensive rural land use and can explain why farming in the Netherlands is intensive compared to the farming in the United States.

I can explain why three-fourths of the land area of the Netherlands is used for farming but only about half of the land area of the United States is farmed.

Location of the Netherlands

The Netherlands is a very small country in western Europe that borders on the North Sea. The word Netherlands means lowland. More than half of the Netherlands is below sea level.

The Netherlands has a very good location at the mouth of the Rhine River. The Rhine is the most important river in Europe. The Rhine River links the industrial areas of West Germany with the North Sea. The great city of Rotterdam in the Netherlands is the second most important port city in the world, second only to New York City. Much of the trade to and from western Europe passes through Rotterdam. Locate these places on a map of western Europe.

The Dutch

The people of the Netherlands are the Dutch. Most of the Dutch people are urban. They live and work in cities. More than nine out of ten people in the Netherlands live in cities and work in offices, stores, or factories. Less than ten per cent of the Dutch people are farmers.

a. Locate Europe on a wall map. Find the North Sea, the Rhine River, and the Netherlands. Why does West Germany need the Netherlands and the city of Rotterdam?

b. Find the city of New Orleans in the United States. On what river is it? How is New Orleans similar to Rotterdam?

c. Is the Netherlands a large or small country compared to the neighboring countries of West Germany and France?

Size of the Netherlands

The table below shows the area of the Netherlands, the United States and several states in the United States. See below.

Country or State	Area in Square Miles
United States	3,600,000 square miles
Georgia	58,876 square miles
NETHERLANDS	15,800 square miles
Maryland	10,577 square miles

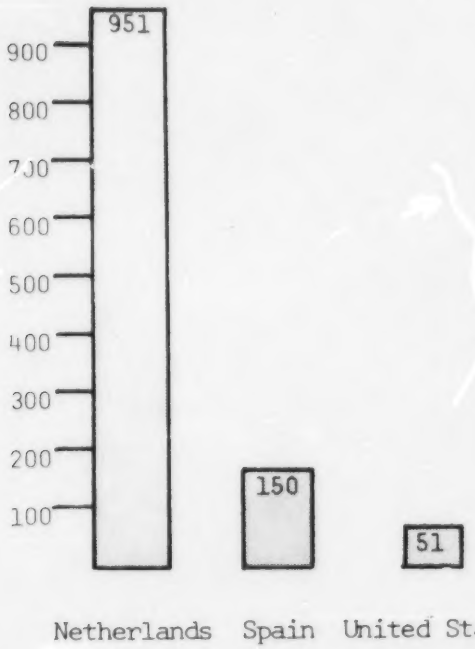
a. Area is one part of the earth complex in the Rural Landscape Model. The table compares the area of the Netherlands with two states in the United States. How does the Netherlands compare with Georgia in area? Is Georgia larger or smaller than the Netherlands?

b. How does the Netherlands compare with your state? Is it half as large as your state? One-fourth as large?

Population Density

Population density refers to the number of people per square mile. Some countries have more people per square mile than others. Look at the graph below.

POPULATION DENSITY PER SQUARE MILE BY COUNTRY



a. One of the three countries in the above graph is not in western Europe. Which one?

b. Which country above has the highest population density? Which country has the lowest density?

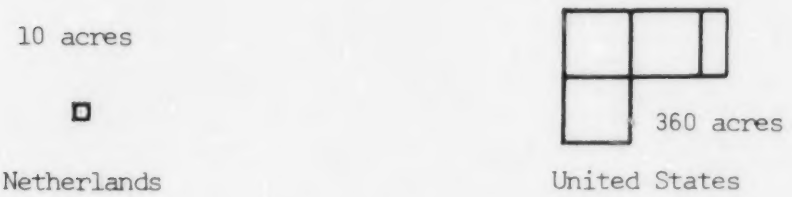
c. Population density is an important factor in the Rural Landscape Model. Is the density of the Netherlands high or low when compared to the United States?

d. Do the Dutch farm differently because their population density is so high?

Farm Size

Farms in the Netherlands are very small. Every tiny area is used for farming. Dutch farms usually have about ten acres or less. See the diagram below.

AVERAGE FARM SIZE IN THE NETHERLANDS AND THE UNITED STATES



a. Are farms in the United States larger or smaller than Dutch farms?

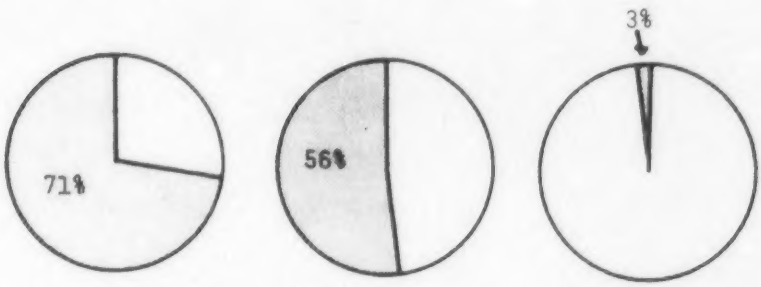
b. Why would you expect the rural population density in the Netherlands to be higher than in the United States?

c. Could an average Corn Belt farmer in the United States make a living on a ten acre farm? Why not?

Cropland

The pie charts below show the percentage of land used for farming in three countries. See below.

PER CENT OF LAND IN CROPLAND



a. Which country has the largest percentage of its land in cropland? Which country has the least amount of land in cropland?

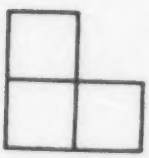
b. Almost three-fourths of the Netherlands is used for growing crops. What proportion of the land in the United States is used for growing crops? Why does the Netherlands devote such a high percentage of its land area to cropland?

Arable Land

The diagrams below show the amount of arable land per person in two countries. Arable land is land that can be used to grow crops. Arable land is land that is not too hot, too wet, too hilly, too dry, or too cold for growing crops. See below.

ARABLE LAND PER PERSON

2 4/5 acres



United States

1/4 acre

Netherlands

a. What is arable land?

b. How much arable land per person is there in the United States? How much arable land per person is there in the Netherlands?

c. How many people must one acre of cropland support in the Netherlands?

d. Is it possible to feed four people on one acre of cropland? Why not?

THE NETHERLANDS:
MIGRATION AND RECLAMATION

7

Overview

Reclamation in the Netherlands is based on modern technology. The Dutch have reclaimed almost half the land area of their country from the sea by draining the water off the land. They first build huge dams that block off the land from the North Sea, creating a lake. Next they pump the salty water from the lake with big electric pumps that run day and night. The Dutch have built towns, farms, and roads on the reclaimed polderlands.

The Dutch are trying to decrease the population density of their country by making new land for the people to settle. The Dutch use modern technology to reclaim land so they can stop the population density in the Netherlands from going even higher.

7

THE NETHERLANDS:
MIGRATION AND RECLAMATION

Terms I Need to Use: migration
reclamation
barrier dam
dike
Zuider Zee (Lake Yssel)
polderland (polders)

Ideas I Must Explain:

I can define migration and explain why the Dutch are willing to migrate.

I can define reclamation and explain why the Dutch work so hard at it.

I can explain the changing of the Zuider Zee into Lake Yssel, and finally into polderland.

I can explain what polders are and can tell why polderlands are completely new rural landscapes.

Review

The Netherlands is a small country in western Europe. It is smaller than many states in the United States. The population density in the Netherlands is one of the highest in the world.

The people of the Netherlands, the Dutch, have tried to adjust to the problem of too many people in two ways--migration and reclamation. Let us discuss these separately.

Migration

Migration occurs when people move from one country to another to live. Many Dutch people have migrated form the Netherlands to other countries. In fact, the Dutch government helps people to migrate by paying part of their fare to another country. Dutch people have migrated to Canada, Australia, South Africa, Brazil, and the United States. Out-migration from the Netherlands has been going on for many years. It is occuring today.

a. What is migration?

b. How does the Netherlands benefit if some of the people migrate to other countries?

c. Does it take courage to migrate from one country to a strange one? Why?

d. Is it migration if you move from one part of town to another? Why not?

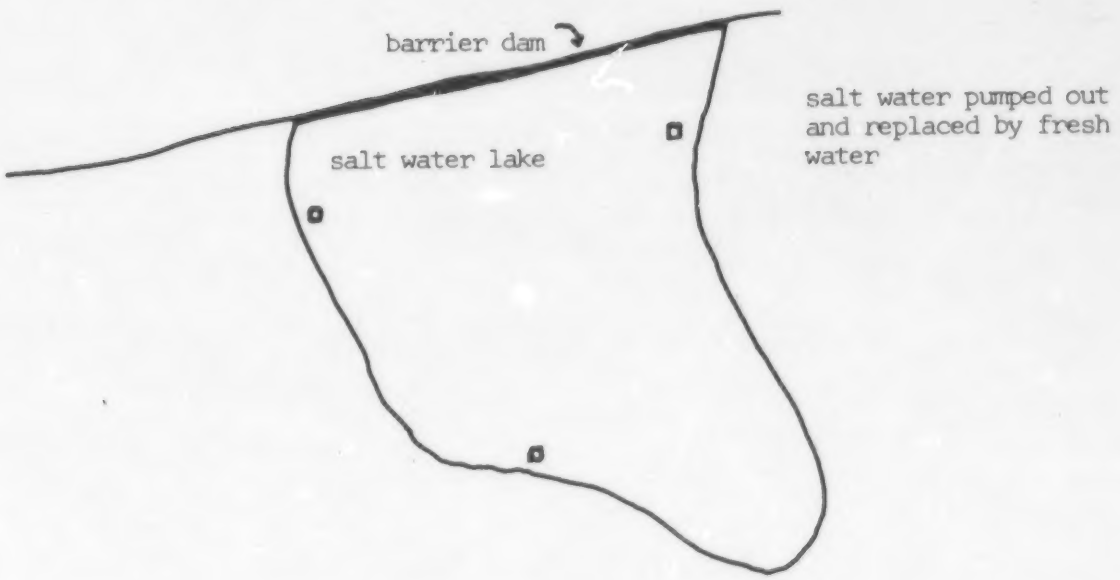
Reclamation

One kind of reclamation is the draining of water so that people can live on the land. Land that has been reclaimed is more useful than it was before. The Dutch reclaim land from the North Sea to increase the area of their country. About half of the Dutch people live on land that has been reclaimed from the sea.

There are two stages in reclaiming land from the sea. First, a dike or barrier dam is built to keep out the sea water. A dike is a high bank of earth, rocks, and concrete which holds the water back. The water inside the dam slowly changes from salt water to fresh water as the salt settles out. Since more than half of the Netherlands is below the level of the North Sea, large areas would be flooded if the dikes were to break. See the map below.

THE FIRST STAGE OF RECLAMATION

pump = ◘



a. What is reclamation?

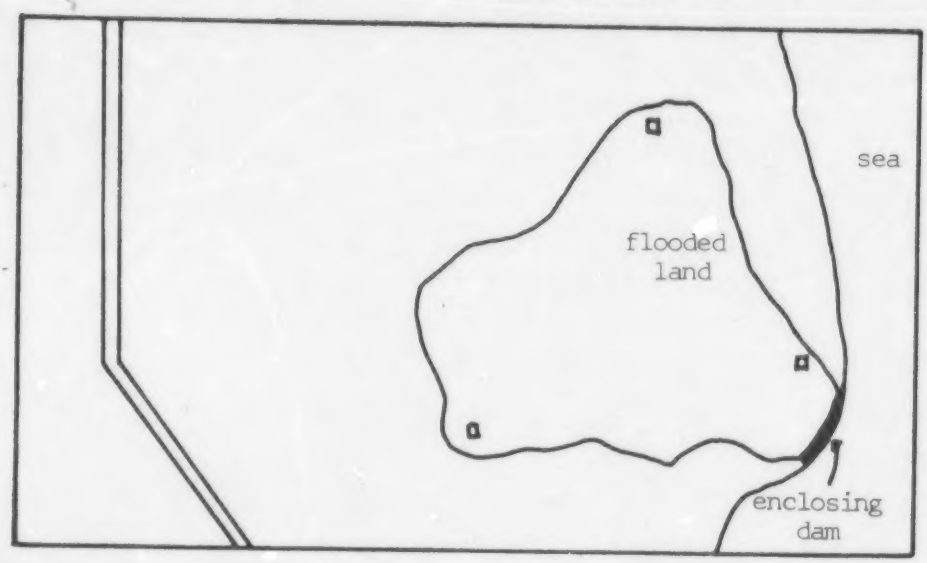
b. Is modern technology required to build a huge barrier dam?

c. Why do the Dutch worry about the dikes breaking?

The second stage of reclamation is to use huge electric pumps to remove the water from the land behind the dams. These pumps run the water into the many canals that run across the Dutch landscape. The canals flow into the ocean. The famous Dutch windmills were used to suck up water from the lowlands. In recent times, however, the windmills have been replaced by electric pumps. The wet, newly drained polders are often planted with reeds to help dry out the land. The reeds are not valuable but they help soak up the water. See the map below.

PUMPING THE LAND DRY IN THE NETHERLANDS

canal = ═══
pumping station = ◘

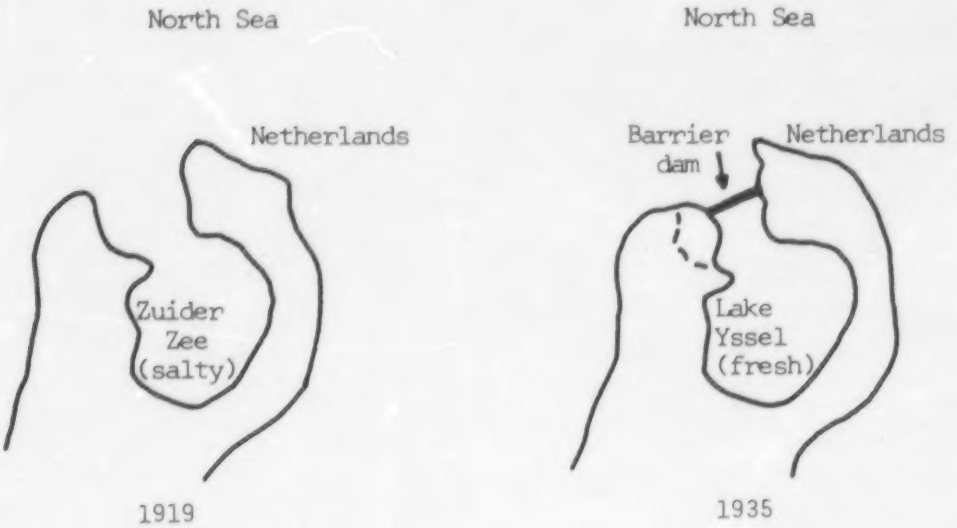


a. Are the huge electric pumps used in the Netherlands an example of muscle power or machine power?

b. Is Dutch reclamation based on advanced technology? Why?

c. What are the two steps in land reclamation in the Netherlands?

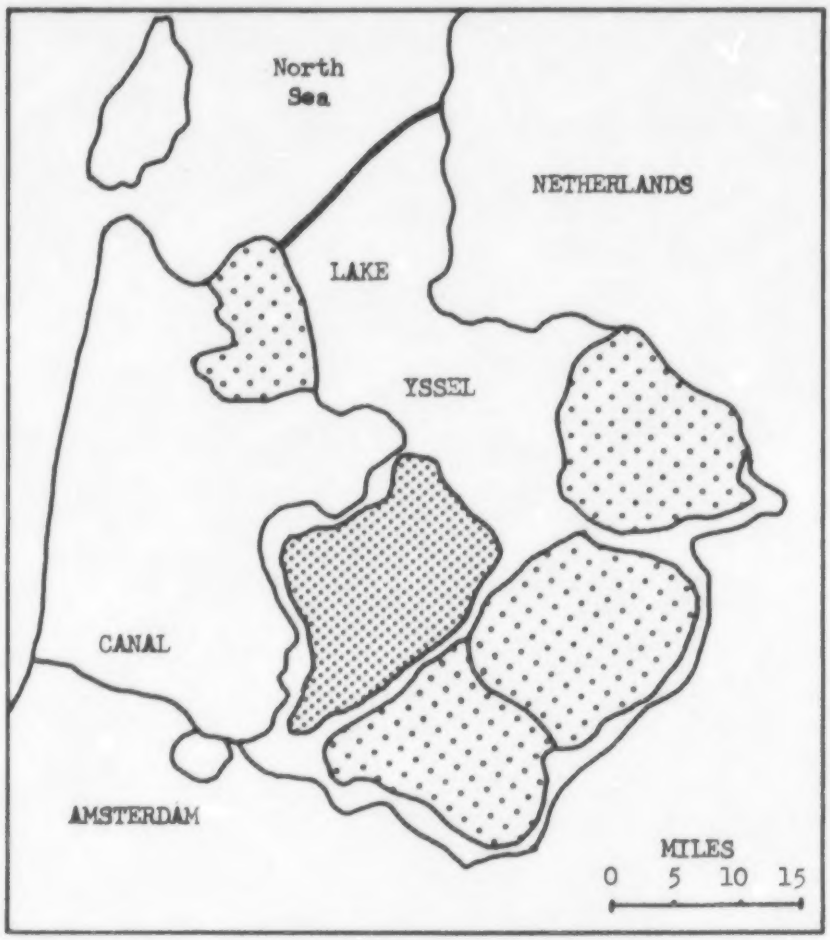
In 1919 the Dutch began to build a 20-mile dike called the Barrier Dam to block the North Sea from the Zuider Zee. The Zuider Zee was a long shallow salt water body that extended inland from the North Sea. The Barrier Dam was completed in 1932, sealing off the Zuider Zee from the North Sea. The salty Zuider Zee was gradually turned into a fresh-water lake, Lake Yssel. See the maps below.



a. The maps above both show the Netherlands. Why was the Zuider Zee salty before the Barrier Dam was built?

b. How does the Zuider Zee differ from Lake Yssel?

Today more than two-thirds of Lake Yssel (Zuider Zee) has been drained and turned into useful polderland. Polderland is a lowland area that has been drained of water. The Dutch polders are completely new landscapes that have been built in a short time. The Dutch have changed Lake Yssel into polders and have built towns, farms, and roads on the reclaimed land. See the map below.



a. Notice in the map that the total land area of the Netherlands has almost been doubled by reclamation. What happens to the reclaimed land? Why has all this new land not lowered the population density in the Netherlands?

b. Can you relate reclamation in the Netherlands to modern technology?

POLDERLANDS AND PLANNED RURAL LANDSCAPES IN THE NETHERLANDS

8

Overview

The rural settlement pattern in the Netherlands is very regular and carefully planned. The small Dutch farms are evenly spread in a checkerboard pattern across the rural landscape. Every tiny area of rural land is planned.

Dutch farming is very intensive. The Dutch use much fertilizer and labor to grow very high yields per acre on their small farms.

The earth complex limits farming in the Netherlands. The Dutch pasture dairy cattle on the wet polderlands because crops do not grow well on the wet soils.

Specialty crops that bring high prices in foreign countries are the crop tradition in the Netherlands. Some examples of high-value specialty crops are flower bulbs, nursery plants, and dairy products. Specialty crop farming in the Netherlands is very intensive. In fact, flower bulbs are often grown in hothouses. Can you buy tulip bulbs from the Netherlands where you live?

POLDERLANDS AND PLANNED RURAL LANDSCAPES IN THE NETHERLANDS

Terms I Need to Use:

- planned settlement
- pasture
- polder (polderland)
- intensive land use
- specialty crop
- hothouse
- flower bulb

Ideas I Must Explain:

I can explain why the polderlands are planned so that every tiny area is used for farming.

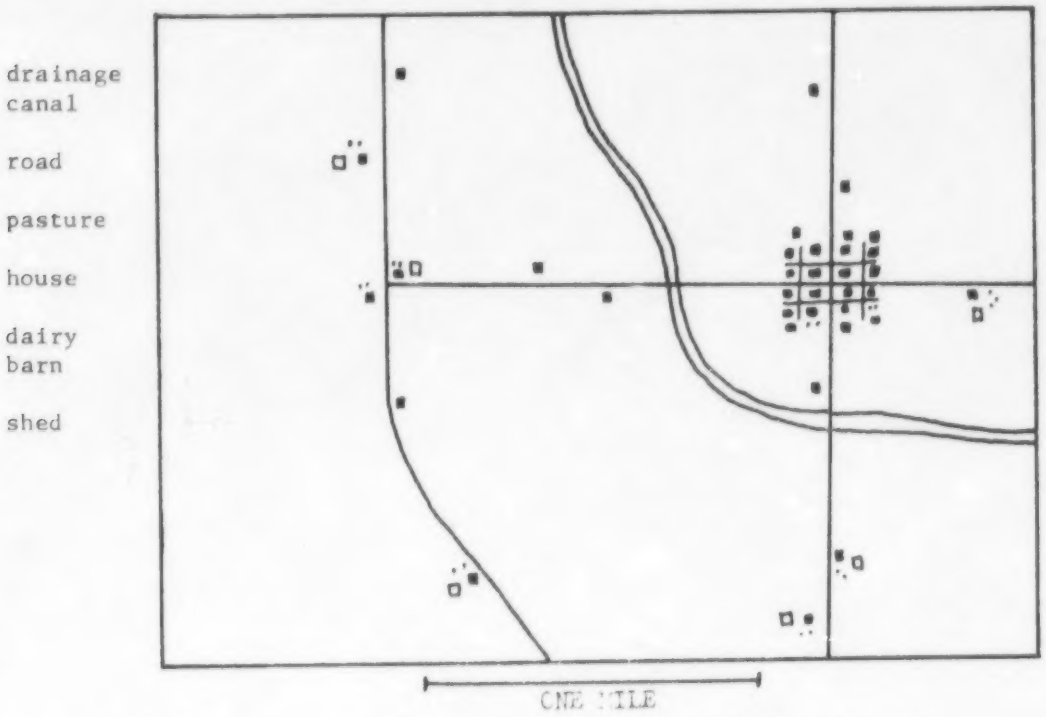
I can explain how the Dutch farmers can make a living on small 10-acre farms by getting high yields of high-value crops--such as vegetables and flower bulbs--and dairy products.

I can explain how the earth complex limits the crops that will grow on the polderlands.

Planned Polders

Dutch polders are carefully planned by the government. The polders are laid out with straight-line roads and square fields. Every detail is carefully planned so that none of the valuable, new polderland is wasted. The polders are so carefully planned that every farmer knows exactly where to build his house and farm buildings. The roads, canals, fences, and fields are carefully laid out by trained planners and engineers. The Dutch polders are an example of the way rural land can be put to the most productive use. See the map below.

PLANNED POLDERLANDS IN THE NETHERLANDS



a. Look at the map. How can you tell that the polderlands are carefully planned?

b. What clues in the legend tell you that most of the farms are dairy farms?

c. Find the drainage canal. Why are drainage canals necessary in the Netherlands? Are there drainage canals in the rural areas where you live? Why not?

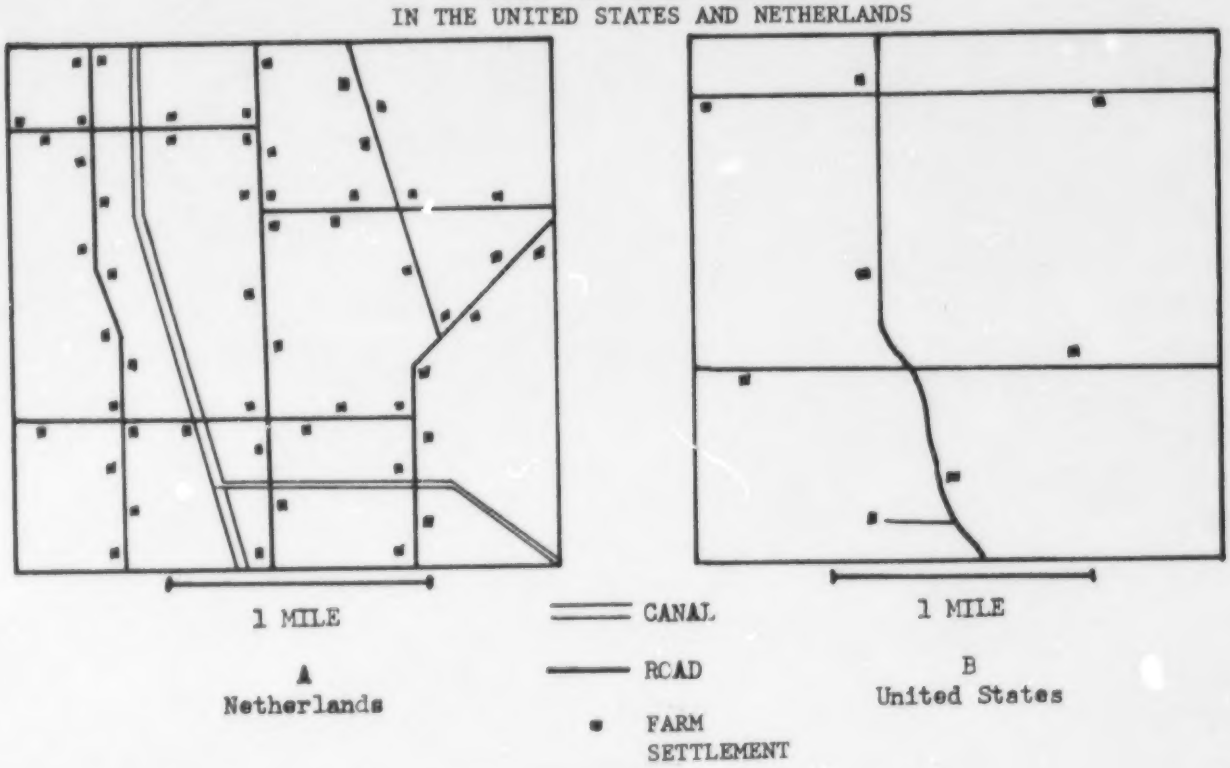
d. Are the polders flat or hilly? Does this make planning easier or more difficult?

e. Would you find forests or fields grown up in weeds in the polderlands? Why not? Is there wasted rural land where you live?

Settlement Pattern

Dutch farmers live on family farms as farmers in the United States do. The rural settlement pattern in the two countries is the same. However, the population density is different since the farms in the Netherlands average ten acres, and the farms in the U. S. average 360 acres. See the maps below.

RURAL SETTLEMENT PATTERNS
IN THE UNITED STATES AND NETHERLANDS



a. Both of the maps above show the same amount of area. Which has the highest population density?

b. Are farms in the Netherlands large or small compared to farms in the United States?

c. Would you expect to find large tractors and other big farm machinery on farms in the Netherlands? Why not?

d. Both maps show the same general type of settlement pattern. Is the pattern a village pattern or a spread pattern?

e. Do you think that farming is more intensive in Map A or B?

The Dutch grow high-value specialty crops for export to other countries. Flowers--especially tulip, hyacinth, and narcissus bulbs--are important Dutch specialty crops. Dutch tulips are world famous and bring a high price in foreign markets. Flower bulbs are an important part of the Dutch crop tradition. They have been growing flowers for export for many years. Can you buy Dutch flower bulbs where you live?

Flowers are a non-food cash crop. They are grown for export to other countries. Flowers are grown under very intensive conditions with very high inputs of labor, seed, and fertilizer. In fact, Dutch flowers and nursery plants are often raised in hothouses to control the weather conditions. A hothouse is a heated greenhouse for tender plants. A hothouse will protect plants such as tender flower bulbs from the climate. Plants do not freeze in a hothouse. The Dutch use technology to offset the earth complex.

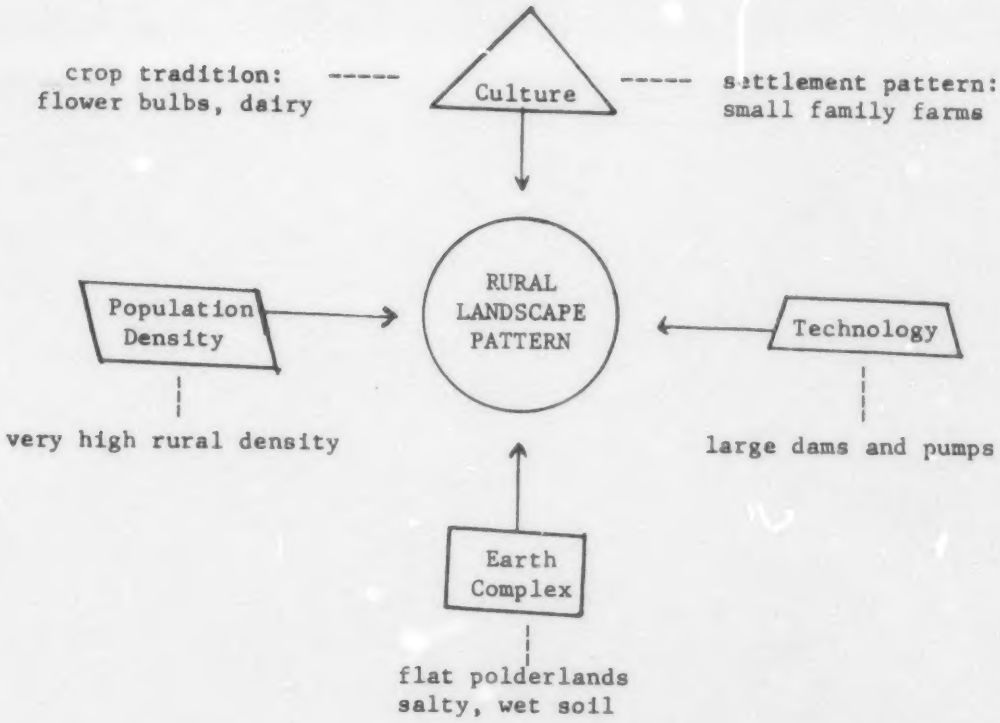
a. What is an export crop? What are the most important Dutch export crops?

b. What is a hothouse? Why is hothouse farming very intensive?

c. Do you think the yields from hothouse farming are high or low?

d. How is hothouse farming related to technology?

RURAL LANDSCAPE MODEL FOR THE NETHERLANDS



Answer the questions below by referring to the Rural Landscape Model above.

Population Density

a. Is the rural population density in the Netherlands higher or lower than in the United States?

b. Are the farms large or small where the rural population density is very high?

Culture

a. What is the crop tradition in the Netherlands?

b. Are the farms in the Netherlands large or small compared to farms in the United States?

Technology

a. How do the Dutch use modern technology in their farming?

b. What is intensive farming? Why is farming in the Netherlands very intensive?

Earth Complex

a. Are the polderlands in the Netherlands flat or hilly?

b. Why are most of the newly drained polderlands planted to dairy pasture?

AUSTRALIA: LOW POPULATION DENSITY AND EXTENSIVE SHEEP STATIONS

9

Overview

The population density in Australia is very low. Australia covers an area that is almost as large as the United States, but its population is only as large as the state of Illinois. Most of the 12 million people in Australia live in the cities along the wet east coast.

The crop tradition in the dry areas of Australia is sheep grazing. With more than 150 million sheep Australia has the largest sheep population in the world.

Sheep grazing in Australia is closely related to the climate. The center of Australia is the Great Victoria Desert where the rainfall is less than 10 inches per year. The huge sheep stations or ranches are on the grasslands around the desert where the rainfall is between 15 and 25 inches.

Sheep grazing in Australia is very extensive. The inputs are very low and the yields are low. It sometimes takes 15 acres of grassland to support one sheep. The population density in the dry, sheep grazing areas is very low. Extensive grazing does not support a large human population.

AUSTRALIA: LOW POPULATION DENSITY AND EXTENSIVE SHEEP STATIONS

Terms I Need to Use: livestock (cattle and sheep)
sheep station
extensive ranching
desert
grassland

Ideas I Must Explain:

I can compare the Netherlands, the United States, and Australia in terms of the rural population density and the physical complex.

I can define and explain what a sheep station is.

I can explain why livestock ranching in Australia is very extensive

I can explain the location of the two major sheep grazing regions in Australia and relate them to the Great Victoria Desert.

Location

Australia is a continent that is also a country. Australia is more than seven thousand miles from the United States. It is sometimes called "down under" because it is on the "Other side" of the earth in the southern hemisphere.

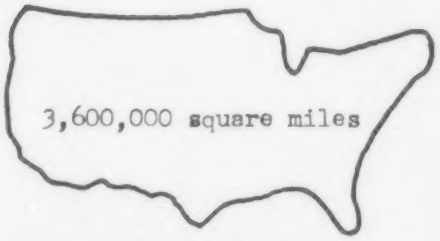
Size of Australia

Australia is a very large country. Let us compare the area of Australia with the United States and the Netherlands. See the maps below.

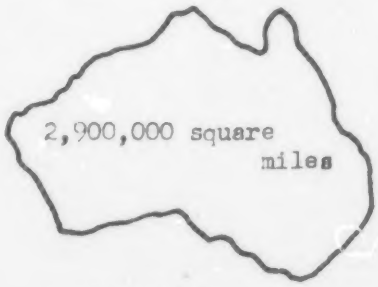
THE AREA OF THREE COUNTRIES

14,000 square miles

Netherlands



United States



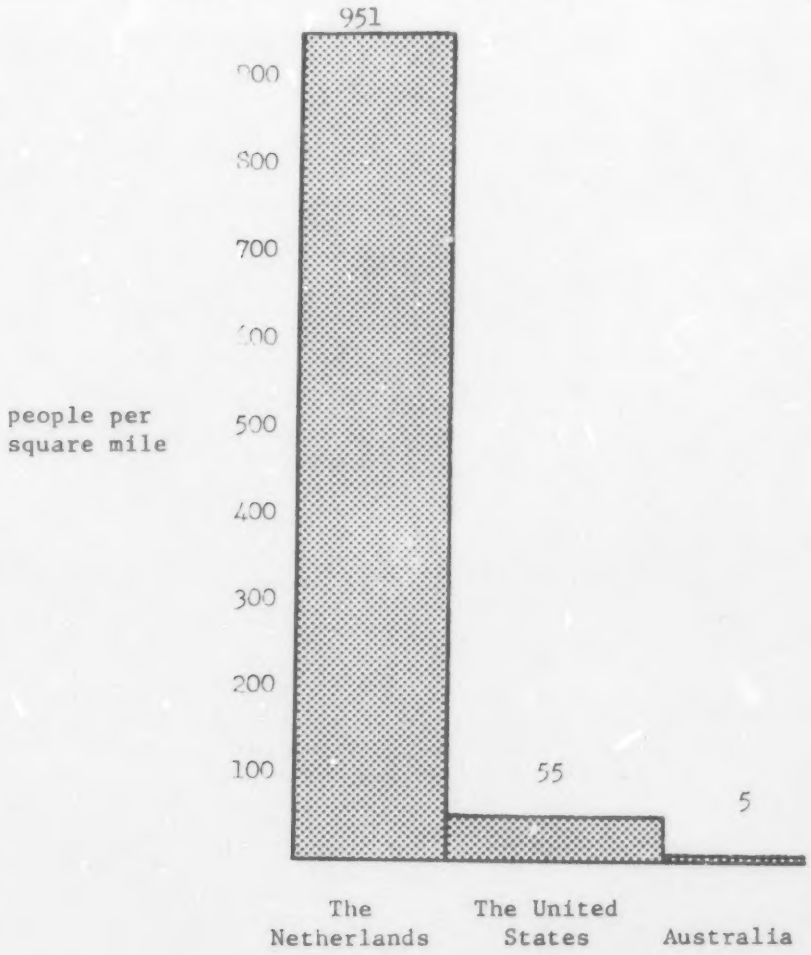
Australia

a. Why is it incorrect to speak of Australia as being on the "other side" of the earth?

b. How does the United States compare in area with Australia? How does the Netherlands compare in area with the United States and Australia?

POPULATION DENSITY

In the United States, The Netherlands, and Australia

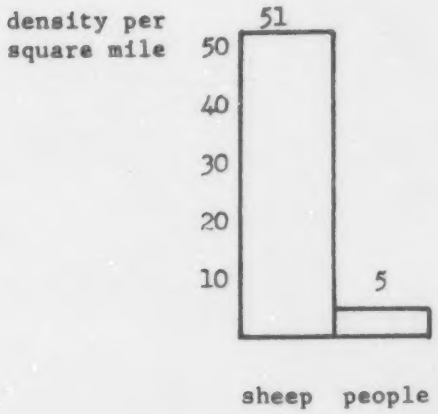


a. Is there a big difference between the population density of Australia and the Netherlands?

b. Remember that the graphs above show <u>average</u> densities and that population density is not evenly spread. Would you expect to find large areas where no one lives in Australia? Why?

Australia has 12 million people and more than 150 million sheep. Australia has more sheep than any other country in the world. The graph below compares the population density per square mile with the sheep density per square mile. See below.

POPULATION DENSITY AND SHEEP DENSITY IN AUSTRALIA



a. Does Australia have more people than sheep?

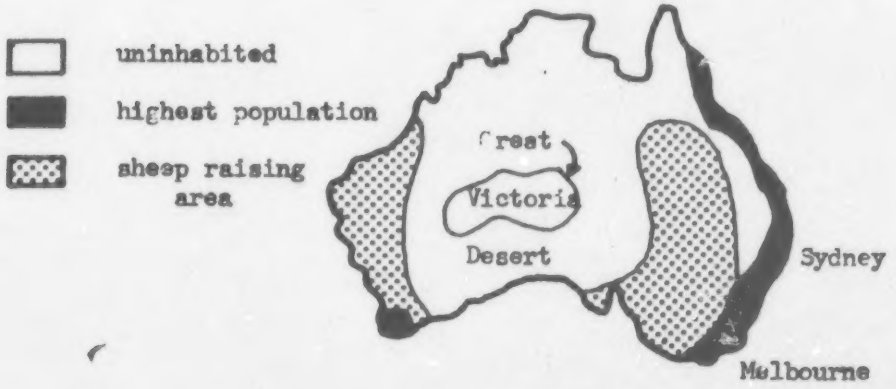
b. Is the population density more or less than the sheep density?

c. Are there more sheep than people where you live?

Crop Tradition

Ranching of beef cattle and sheep is the most important rural activity in Australia. There are more than 10 sheep and 3 beef cows for every person in Australia. The map below shows the two important sheep raising areas. See below.

PEOPLE AND SHEEP IN AUSTRALIA



Study the map above. The center of Australia is a desert. The rainfall in a desert is less than ten inches a year and there is almost no vegetation. The sheep growing areas are the grasslands that surround the desert. Australia's sheep population is mainly found in areas with a rainfall of from 15 to 25 inches per year.

a. Locate the big cities in Australia--Sydney and Melbourne. Are they desert cities or seaports?

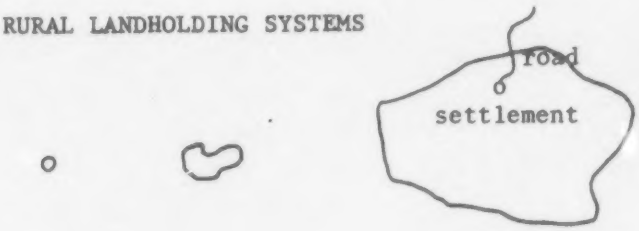
b. Notice the two sheep raising areas in the map above. Are there many sheep or people in the central area?

c. Can you relate sheep farming to the physical complex?

Extensive Land Use

Rural landholdings in Australia tend to be very large. Some sheep ranches have more than 10,000 sheep and spread across thousands of acres. Large sheep ranches in Australia are called sheep stations. An average sheep station in Australia has 1,000 acres. Look below at the scale maps of three different rural landholding systems. See below.

RURAL LANDHOLDING SYSTEMS



COUNTRY	AVERAGE ACRES
A--Australia	1,000 acres
B--United States	360 acres
C--The Netherlands	10 acres

a. Which country belongs to Map A? To B? Which map shows a rural landholding in Australia?

b. Map C shows a sheep station in Australia. Why are sheep stations so large compared to farms in the Netherlands or the United States?

c. Assume that each of the three rural landholdings supports 5 people. Is the population density on the Australian sheep station high or low?

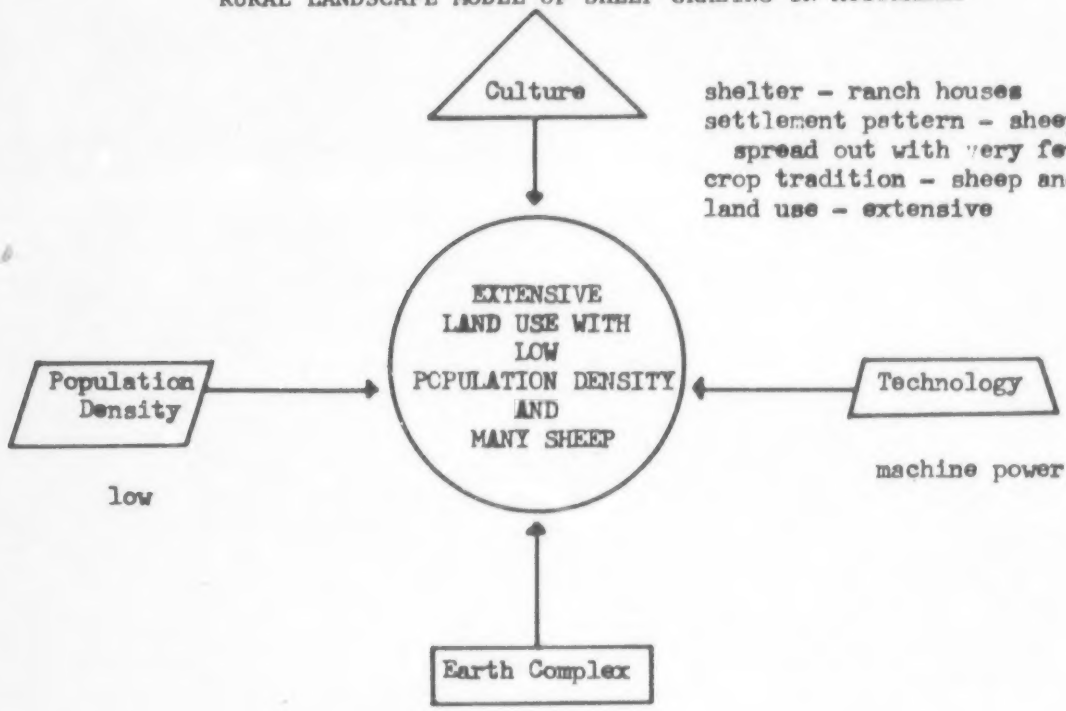
Sheep stations in Australia are an example of an extensive land use. An extensive rural land use has low inputs of labor, seed, and fertilizer per acre. Low yields per acre result. In Australia the ranchers simply graze sheep on the grasslands which are watered by rainfall. In some areas of Australia more than 15 acres are needed to keep one sheep in grazing for a year. The input of labor per acre is very low. This is a very extensive rural land use system.

a. How is intensive farming different from extensive farming?

b. Why are the yields from extensive farming or ranching very low per acre?

c. Why can the ranchers in Australia afford to have a low yield per acre when the farmers in the Netherlands cannot?

RURAL LANDSCAPE MODEL OF SHEEP GRAZING IN AUSTRALIA


Culture
shelter - ranch houses
settlement pattern - sheep stations spread out with very few villages
crop tradition - sheep and cattle
land use - extensive
EXTENSIVE LAND USE WITH LOW POPULATION DENSITY AND MANY SHEEP
Population Density
low
Technology
machine power
Earth Complex
land - flat or rolling
climate - dry
vegetation - thin grass or desert

Study the model above. Now answer the questions below.

Culture

a. How is the crop tradition in Australia different from that in the Corn Belt?

b. Are small farmsteads in the Netherlands as spread out as sheep stations are in Australia?

c. Can you relate the rural settlement pattern in the Netherlands to the earth complex?

Technology

a. Suppose that through technology Australians were able to irrigate (bring water to) large areas of the desert. Do you think this would change the crop tradition? Land use? Population density?

Earth Complex

a. How does the earth complex affect the rural land use in Australia?

Population Density

a. Can you explain why the rural population density is so very different from the Netherlands?

b. Is there wasted rural land in Australia?

JAPAN: HIGH RURAL POPULATION DENSITY AND NOT ENOUGH FLAT LAND

10

Overview

The population density in Japan is very high. The rural population density in Japan is one of the highest in the world. One square mile of arable land must support more than four thousand people in Japan. Is it possible to grow enough food on one arable square mile to feed four thousand people?

The amount of land that can be farmed in Japan is limited by the earth complex. Since most of the total land area is forested and mountainous, only one-sixth of Japan can be used for cropland. Farmers in Japan are crowded onto the limited areas of flat land.

JAPAN: HIGH RURAL POPULATION DENSITY AND NOT ENOUGH FLAT LAND

Terms I Need to Use: density per arable square mile
animal protein

Ideas I Must Explain:

I can explain why rural Japan is overcrowded and lacking in arable land.

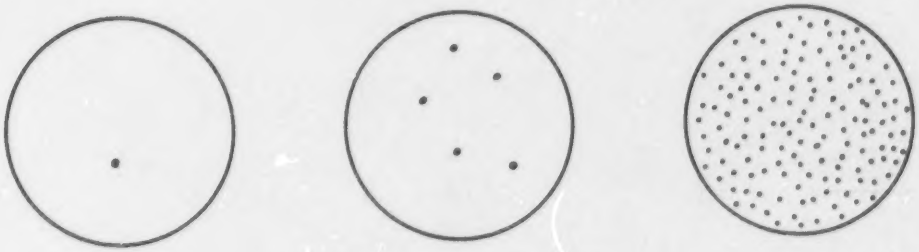
I can explain that 5/6 of Japan is forested and mountainous, leaving only 1/6 for cropland.

I can explain why Japan has the highest rural population density in the world, even higher than the Netherlands.

Japan is a nation of four islands in East Asia. It is an island country about the size of the state of California. Locate Japan on a wall map. What large country is it near? Japan has slightly more than 100 million people, or about one-half the population of the United States. See the graphs below.

POPULATION DENSITY

Comparing Australia, the United States, and Japan

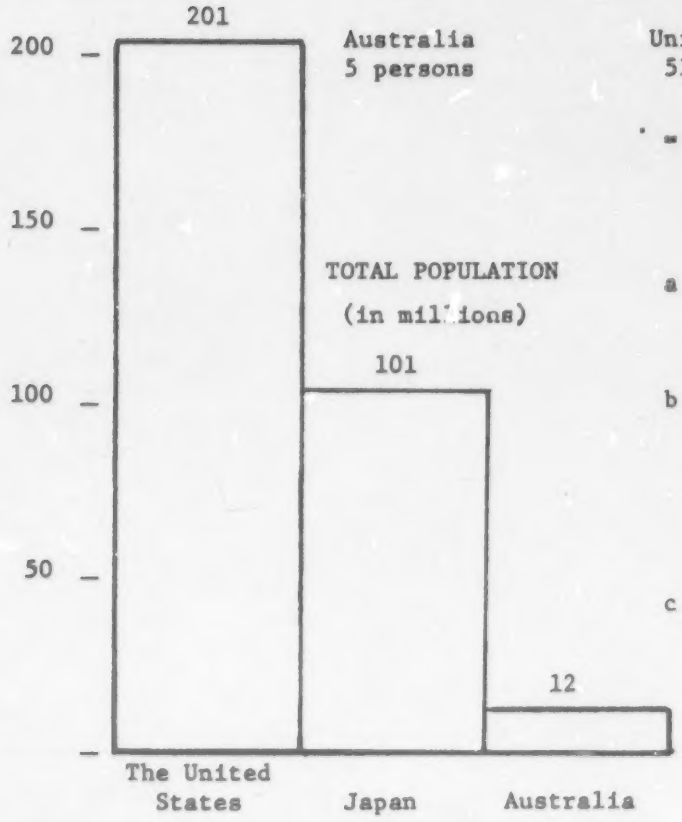


Australia
5 persons

United States
51 persons

Japan
686 persons

• = 5 persons



a. What two variables are shown in the graphs above? For what three countries are the data?

b. Compare the United States and Japan in terms of total population.. How many people are there in each country? Are there many countries in the world with more than 100 million people?

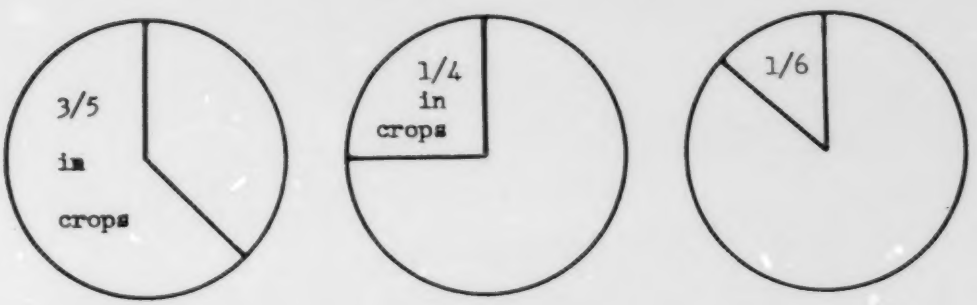
c. Compare the United States and Japan in terms of population density? Is the difference great?

More than two-thirds of the land area in Japan is forested and mountainous. The steeply sloped hillsides are covered with trees. The people do not live on the forested mountains. Instead, they live on the flat coastal plains near the sea and in the narrow river valleys. The big cities such as Tokyo and Nagoya are on the coastal plains. Small farm villages are found in the narrow lowlands along the river valleys.

The forested Japanese landscape is pretty and green all year. Forests cover more than two-thirds of Japan's total land area. If you were to fly across Japan, you would see forested (green) mountains nearly everywhere. It is hard to believe that 100 million people are crowded onto the four mountainous islands that make up Japan.

Because of the many mountains, Japan has limited flat land for farming. For every acre of flat land there are six acres of forested mountains. The amount of land that can be used for cropland in Japan is very small. See the pie charts below.

PERCENTAGE OF TOTAL LAND AREA USED FOR CROPS



The Netherlands The United States Japan

a. Which country above has the most land in crops?

b. Which country has the least land in crops?

c. Why is only 1/6 of the total land area in Japan used to grow crops?

The data table below shows the number of persons per arable square mile for four different countries. (Remember: Arable land is land that can be used for growing crops. Arable land is not too wet, too dry, too cold, or too steep for cultivation.) Look at the data table below.

POPULATION DENSITY

Per Arable Square Mile

JAPAN	4200
The Netherlands	2600
The United States	270
Australia	72

a. What is arable land?

b. Which country has the highest population density per acre of arable land?

c. The Japanese attempt to feed 4200 people from one acre of arable land. Is it possible to grow enough food on one acre to feed that many people?

d. Is Japan more crowded than the Netherlands? Why? Can you relate the high population density in Japan to the earth complex?

The Japanese cannot reclaim land from the sea as the Dutch have done in the Netherlands. Japan is a group of mountainous islands. It is surrounded by very deep seas and the Pacific Ocean. The only way the Japanese can expand their cropland is to farm the steep hillsides. They grow fruit trees and tea on very steep slopes.

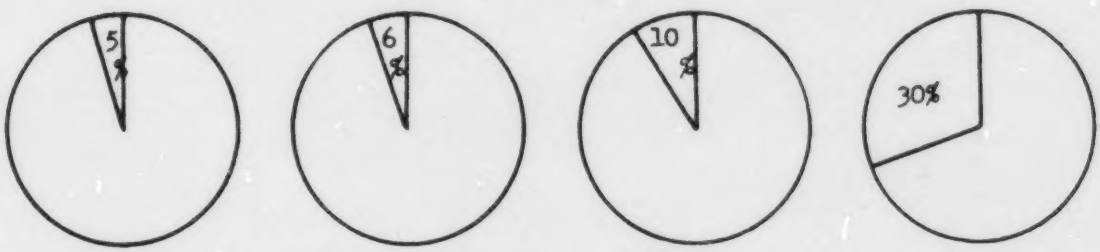
a. Why can't the Japanese reclaim land from the sea?

b. How do the Japanese increase the amount of farmland in Japan?

c. Do you think the Japanese use machine power technology such as big tractors or grain combines on the steep hillsides? Why not?

Rural Japan has the highest population density in the world. The pie charts below help to explain why the density in rural Japan is so high. See below.

PERCENTAGE OF TOTAL POPULATION WHO ARE FARMERS



a. What percentage of the population in Japan are farmers? Is this a large percentage compared to the other countries?

b. We know that 30% of the Japanese are farmers but only 1/6 (17%) of the land area is arable. How do these two facts help to explain why Japan has the highest rural population density in the world?

Japan is more overcrowded than the Netherlands. It has too many people for the land to support. In order to try and feed their people, the Japanese have increased their food production in two ways. First, they grow the highest yields per acre in the world. Farm yields in Japan are higher than yields in the Netherlands, and much higher than yields in the United States. Second, the Japanese get large amounts of animal protein from the sea. Animal protein comes from meat and fish. It is necessary for strong bones and red blood. The Japanese get more than half of their animal protein from fish taken from the sea. Fishing is very important to the Japanese. This is why most rural Japanese families live in small villages along the coast. If you were to eat a typical meal in Japan, it would be made up of some combination of fish and rice.

a. Why is Japan overcrowded?

b. In what two ways have the Japanese increased their food production?

c. What is animal protein? From what foods do Japanese get this protein?

d. From what foods do people in the United States get their

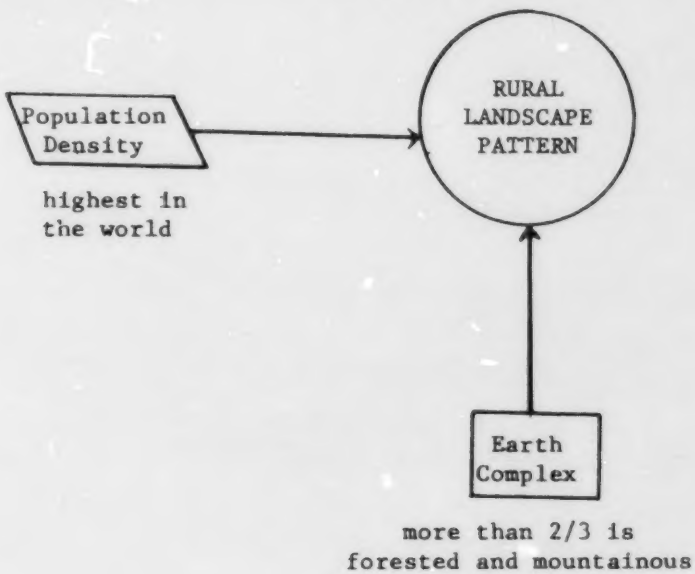
Japan has too many people and not enough level cropland. Much of the flat land is taken up by towns and cities. The cities are growing and taking up even more of the suitable cropland. The result is that Japan can only grow four-fifths of the food it needs. The other one-fifth is imported. To <u>import</u> is to buy something from another country. Japan imports wheat, corn, soybeans, and sugar from other countries.

a. Why is there a shortage of level cropland in Japan?

b. Does Japan grow enough food to feed the people? Why not? Where do they get the extra food they need?

Study the diagram below.

RURAL LANDSCAPE MODEL FOR JAPAN



a. What two factors in the Rural Landscape Model are shown in the diagram above?

b. How does the earth complex limit the amount of level cropland in Japan?

c. Is the rural population density in Japan very high? How is the high rural population density in Japan related to the earth complex?

JAPAN:

THE RURAL LANDSCAPE PATTERN

11

Overview

The rural settlement pattern in Japan is a pattern of unplanned villages. Farmers in Japan live in small farm villages called burakus and walk to their tiny faims each day. The farm village, or buraku, is very important to the rural way of life. Japanese farmers do not usually live on the land they farm as the farmers in the United States and the Netherlands do.

Farming is very intensive in Japan. Japanese farmers grow some of the highest yields per acre in the world. Because an average farm has only 2½ acres, the Japanese can work many hours on each acre of cropland to get high yields.

Rice is the crop tradition in Japan. Farmers in Japan grow wet rice wherever the land is level enough for water to stand. On the steep hillsides they grow field rice, vegetables, and tea.

11

JAPAN:
THE RURAL LANDSCAPE PATTERN

Terms I Need to Use: buraku
paddy (wet rice)
intensive land use/extensive land use

Ideas I Must Explain:

I can explain why every care is taken to make the Japanese farm village very small.

I can recognize the different forms of farm village on a map.

I can define intensive land use and explain why Japan has the most intensive rural land use system in the world.

I can explain the difference between wet rice and field rice.

Japanese farmers live in small villages. The traditional farm village, or buraku, is a small cluster of houses. Each house is placed as closely as possible to the other houses so that the village takes up as little area as possible. The farmer walks or rides a Honda to his farm plot. Many farmers in Japan have other jobs and farm their tiny plots in their spare time.

A typical Japanese farm house has six rooms. Japanese farm houses are very small compared to farm houses in the Corn Belt. To make the small rooms useful, the low tables, cushions, and bedding are stored in cupboards and taken out for meals and for sleeping. There are no chairs as we know them because the Japanese sit on cushions. Most Japanese farmers have a television set and a motorcycle.

a. What is a buraku?

b. Why are the houses packed together in the villages?

c. Mark off an area in your classroom that is twelve feet by nine feet. This is the area of a room in a farm house in Japan. How does this compare with rooms in houses in the United States?

d. Is Japanese furniture large or small compared to ours? Why?

There are three basic types of farm village (buraku) in Japan.

1) A <u>street village</u> is a narrow string of houses along a road or river. Street villages are often found in the narrow river valleys.
2) A <u>crossroads village</u> is a group of houses around the intersection of two roads. A crossroads village usually occurs on the flat coastal plains.
3) A <u>rectangular village</u> is a compact group of houses along several streets. A rectangular village is larger than the other villages. Look at the two maps below.

TWO VILLAGE PATTERNS

a. Does diagram A show a street village or a crossroads village? Why?

b. Does diagram B show a street village or a crossroads village? Why?

c. Do you think the street village in A is in a narrow river valley or on a flat coastal plain? Why?

d. How do the farmers who live in these villages get to their farms?

The data table below shows average farm size in the countries we have discussed. See below.

Country	Average Farm Size
Australia	1,000 acres
United States	360 acres
The Netherlands	10 acres
JAPAN	2½ acres

a. Are Japanese farms large or small? Are they smaller than farms in the Netherlands?

b. Is the size of the farms related to the population density? How?

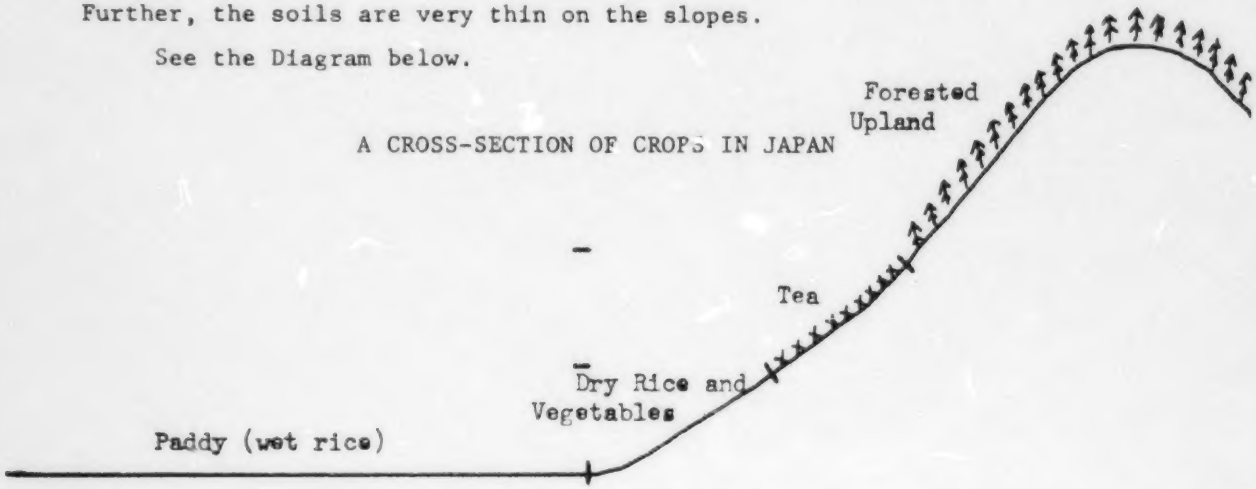
c. Why do Japanese farmers use garden tractors rather than large field tractors such as we have in the United States?

Rice is the most important Japanese crop. There are two types of rice--wet rice and field rice. Wet rice grows in flooded fields. Another term for wet rice is paddy. Paddy is wet rice. Do not say "paddy rice." This is like saying "rice rice." Field rice is grown on the hillsides. It grows less food per acre than wet rice and requires less labor. Therefore, we can say that wet rice farming is more intensive than field rice farming.

The Japanese grow tea and many types of vegetables. The flat land is used for growing paddy. The gently sloping land is used to grow field rice and vegetables. The steepest slopes are used to grow tea. The land above the tea fields is extremely steep and forested. These forested hilltops are too steep and too cold for any crop. Further, the soils are very thin on the slopes.

See the Diagram below.

A CROSS-SECTION OF CROPS IN JAPAN



a. What is the main food crop in Japan? How does wet rice differ from field rice? Which type grows the highest yields per acre?

b. Look at the diagram. Why is paddy grown in the lowlands where the land is flat? What is wrong with saying "paddy rice"?

c. Would you say the steep forested uplands are arable? Why not?

Japanese farming is the most intensive in the world. An intensive land use has very large inputs of labor, fertilizer, seed, and especially labor per acre. Japanese farms are more like our gardens because they are tiny and produce very high yields.

Paddy (wet rice) is an intensive crop because it requires high inputs of hand labor (for transplanting, irrigation, and harvesting), water, and fertilizer. Paddy grows the most food per acre of any crop. Paddy farming in Japan is more intensive than tulip growing or vegetable farming in the Netherlands.

	INTENSIVE LAND USE		EXTENSIVE LAND USE	
SIZE	Small Farm		Large Farm	
POPULATION DENSITY	High Density		Low Density	
PLANT DENSITY	Many Plants per Acre		Few Plants per Acre	
LABOR INPUT	Many Hours per Acre by Muscle Power		Few Hours per Acre by Machine Power	
YIELD	High Yield per Acre		Low Yield per Acre	
EXAMPLES	Paddy	Japan, All Asia	Sheep	Australia
	Tulips	The Netherlands	Wheat	Canada
	Fruit	Florida	Trees	Georgia

a. Define intensive and extensive land use. Which type applies to Japan?

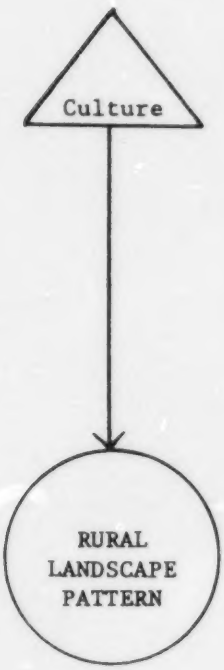
b. Why are Japanese farms like gardens in the United States? Is this related to intensity?

c. Japan and the Netherlands both have high population densities and intensive farming systems. Why do areas with a high population density tend to have intensive farming systems?

d. Why does intensive farming tend to produce high yields?

e. Why are there no livestock on intensive farms?

RURAL LANDSCAPE MODEL FOR JAPAN



Settlement Pattern: unplanned farm villages

Crop Tradition: wet rice, field rice, tea

Intensive Land Use: very high inputs of labor and fertilizer

Farm Size: very tiny farms, 2½ acres

a. What idea in the Rural Landscape Model is shown above?

b. Do farmers in Japan live on their farmsteads or in farm villages?

c. Is rural land use intensive or extensive in Japan? Why?

d. Are farms large or small in Japan? Are Japanese farms even smaller than farms in the Netherlands? Why?

JAPAN:
INTENSIVE CULTIVATION AND MODERN TECHNOLOGY

12

Overview

The crop tradition in Japan is rice. More than half the total cropland is planted to rice. Rice is the main food crop in Japan. Paddy (wet rice) grows more food per acre than any other crop.

Farming in Japan is very intensive. Japanese use farming methods that require very high inputs of labor such as terracing, double cropping, intercropping, and transplanting. The Japanese grow the highest yields per acre for many different crops, including rice.

Japanese farm technology is the most advanced in the world. Farmers in Japan use four times as much fertilizer per acre as farmers in the United States. Machine power technology is important to Japanese farmers. They use many small hand tractors.

The earth complex sets limits to the amount of arable land. Only 1/6 of Japan can be used for cropland. While large areas are too steeply sloped and forested for farming, the growing season in northern Japan is too cold for intensive farming. The Japanese have turned to the sea for their protein. They get protein from fish rather than meat because they do not want to use valuable cropland for grazing livestock.

JAPAN:
INTENSIVE CULTIVATION AND MODERN TECHNOLOGY

Terms I Need to Use:
- terrace (terracing)
- double cropping
- triple cropping
- intercropping
- transplanting
- fertilization
- mechanization
- paddy (wet rice)
- field rice (dry rice)
- seed bed

Ideas I Must Explain:

I can list, define, and explain several methods used by Japanese farmers to increase yields per acre.

I can suggest reasons why Japan has the highest crop yields in the world for many crops, including rice.

I can explain the difference between intercropping and double cropping, and can tell how they increase yields.

I can explain why the Japanese must import 1/5 of their total food.

I can explain why the Japanese get protein from fish rather than meat.

The Rice Tradition

More than half of the cropland in Japan is used to grow rice. Rice is the main food crop in Japan and throughout Asia. Asians--including the Japanese--grow rice for two reasons. 1) Rice is the crop tradition in Asia. The Asians have been growing rice for many centuries. Rice is an important part of the Asian culture. It is the most important food crop for millions of people in Japan and for hundreds of millions in Asia. Rice affects the rural landscape pattern more than anything else. 2) Paddy (wet rice) can produce more human food per acre than any other crop. No other crop grows more food energy per acre than paddy. The Asian countries must grow high yields of food per acre to feed their people. Paddy is grown wherever possible in Asia and in Japan. Look at the table below.

RICE YIELDS IN 1968	
JAPAN	78 bushels per acre
China	55 bushels per acre
United States	50 bushels per acre
World Average	30 bushels per acre

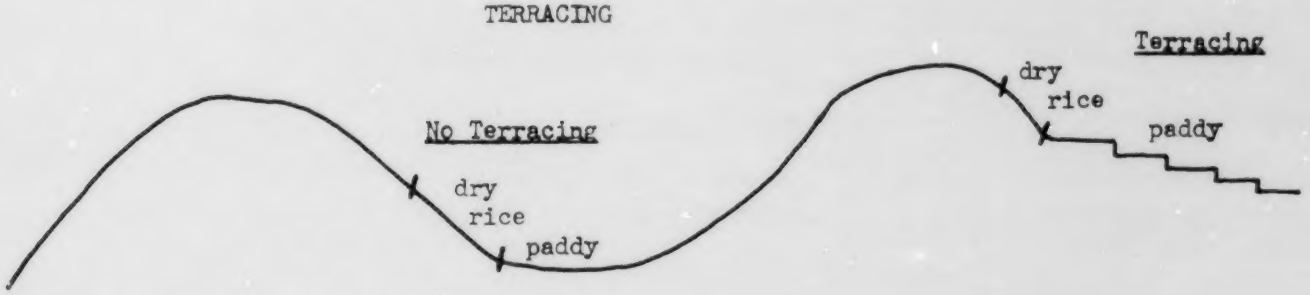
a. What are the two reasons that the densely populated countries in Asia grow rice as the main food crop?

b. The table above shows that the Japanese grow the highest rice yields in the world. How do rice yields in Japan compare with those in the United States?

We have learned that level cropland is limited in Japan. The people are crowded into the lowland areas. The Japanese use several methods to get high yields from their small fields. Some methods of increasing farm yields per acre in Japan are discussed in this activity.

1. Terracing. Japanese farmers build terraces on the hillsides. A terrace is a flat bench on the side of a hill. Terraces are built to control the flow of water on the paddy fields and to increase the area of flat paddy cropland. Terraces require many hours of hand labor to build. They must be repaired every year. Terraces on the hillsides are part of the rural landscape throughout Asia. See the diagram below.

TERRACING



a. Why do Japanese farmers build terraces?

b. Why must the land be flat to grow paddy?

c. Is terracing intensive or extensive? Why?

2. Double Cropping. To double crop is to grow a winter crop and a summer crop in the same field. Rice is nearly always the summer crop in Japan. Rice is planted in May and harvested in September. The second crop is often a vegetable (carrots, beans, peas, cabbages) or a grain such as wheat or millet. The second crop is planted immediately after the first crop (rice) is harvested. The second crop is harvested between January and March. This is possible because southern Japan has mild winters. The fields are made ready for the summer paddy crop as soon as the winter crop is harvested.

The big advantage of double cropping is that the field is used to grow crops all year. In some areas in southern Japan there is triple cropping--growing a summer crop (paddy) and two winter vegetable crops. Northern Japan and the big forested mountains are too cold for double cropping.

···· northern limit of rice

– – – northern limit of a winter crop in the rice fields

a. What is double cropping? Does double cropping increase the yields per acre? How? What is triple cropping?

b. Look at the map. Name the four main islands of Japan. What is the big island? Where is Tokyo? Can you locate China, Korea, and the Sea of Japan?

c. Why is there no double cropping north of the dashed line? Why is there no rice grown north of the dotted line?

3. Intercropping. Intercropping is the growing of more than one crop in the same field at once. "Inter" means between. Intercropping is growing a second crop between the rows of another crop. The Japanese often grow soybeans or cabbages on the narrow dikes around the paddy fields and terraces. They also grow vegetables in the same field with field rice and tea bushes. One of the big problems with intercropping is that there is no room in the field for machines. Thus nearly all the work must be done by hand labor. The Japanese are willing to do the added work in order to get the extra food. Intercropping is sometimes used in our gardens in the United States. One example is planting beans in corn fields.

a. What is intercropping? How does intercropping increase food production in Japan?

b. How does intercropping differ from double and triple cropping?

c. Why is intercropping very intensive?

4. Transplanting. Transplanting is the transferring of the small rice shoots from seed beds into the main paddy fields. Transplanting helps to insure that every square inch of the field will grow a healthy plant. Transplanting requires great inputs of hand labor because every single plant must be transplanted.

a. What is transplanting?

b. How does transplanting increase yields?

c. Why does transplanting require a lot of hand labor?

5. Fertilization. The Japanese use more fertilizer per acre than any other farmers in the world. They need to fertilize their soil because they expect to produce high yields year after year. Japanese farmers are very skilled with fertilizer. Japanese farmers use four times as much fertilizer per acre as farmers in the United States.

a. How does the amount of fertilizer per acre used by a farmer in Japan compare with that used by a farmer in the United States?

b. Why do the Japanese need large amounts of fertilizer?

6. Mechanization. Mechanization refers to the use of machine power to replace hand labor. Small garden tractors are replacing hand labor in Japan. One small garden tractor does the work of four or five people working with hand tools such as a hoe.

a. What is mechanization? Is there very much hand labor in American agriculture?

b. Does a person ride a garden tractor or walk behind it?

c. How is a garden tractor more efficient than hand labor?

The shortage of good arable land has forced the Japanese to use intensive farming methods. Despite the intensive farming methods, Japan still does not grow enough food to feed its people. Japan must buy about 1/5 of its food from other countries. Japan buys food from the United States, especially rice and soybeans.

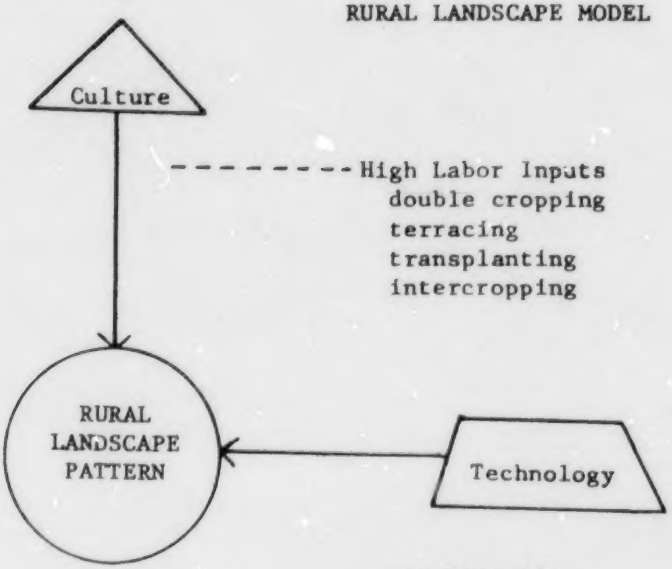
Japan is the leading fishing country in the world. Nearly all the animal protein in the Japanese diet comes from fish. The Ja Japanese have turned to the sea for protein. They have a very large fishing fleet. The Japanese eat very little meat such a pork or beef because they cannot afford to feed their crops to animals. Nearly all the crops in Japan are eaten directly by people. Cropland in Japan is used to grow food crops rather than feed crops. They do not waste valuable cropland on feed crops for animals.

a. Japan has the highest rural population density in the world. Japan also grows the highest yields per acre in the world. How are population density and yields per acre related?

b. Where do the Japanese get their protein? Why don't the Japanese get protein from beef cattle and hogs as we do?

Study the Model below.

RURAL LANDSCAPE MODEL



a. What two factors of the Rural Landscape Model are shown above?

b. Can you tell why each of the methods under culture requires very high labor inputs?

c. Japan buys food from other countries to feed its people. Does Japan have to buy food because Japanese farm technology is not modern or are there other reasons?

d. Why must Japanese farmers use great amounts of fertilizer?

THE EARTH COMPLEX OF THE U.S.S.R.: HUGE AND COLD

13

Overview

The earth complex in the Union of Soviet Socialist Republics (U.S.S.R.) has an important influence on the rural landscape pattern. The U.S.S.R. is a gigantic country. As the largest country in the world, it covers an area that is larger than all of North America. Because of its great size, the U.S.S.R. has many different types of rural landscapes.

The climate of the Soviet Union is harsh. It can be compared with the climate in Canada. The Soviet Union has a short growing season. Farming is limited by permafrost. More than 2/3 of the U.S.S.R. is either too cold or too dry for farming.

The Fertile Triangle of the Soviet Union can be compared with the Corn Belt in the United States. Each region is the major farming area in its country. Almost 4/5 of the suitable cropland in the Soviet Union is in the Fertile Triangle.

THE EARTH COMPLEX OF THE U.S.S.R:
HUGE AND COL[illegible]

Terms I Need to Use: permafrost
growing season
Fertile Triangle

Ideas I Must Explain:

I can compare the United States and the U.S.S.R. in size.

I can define permafrost and explain why it limits farming in large areas of the Soviet Union.

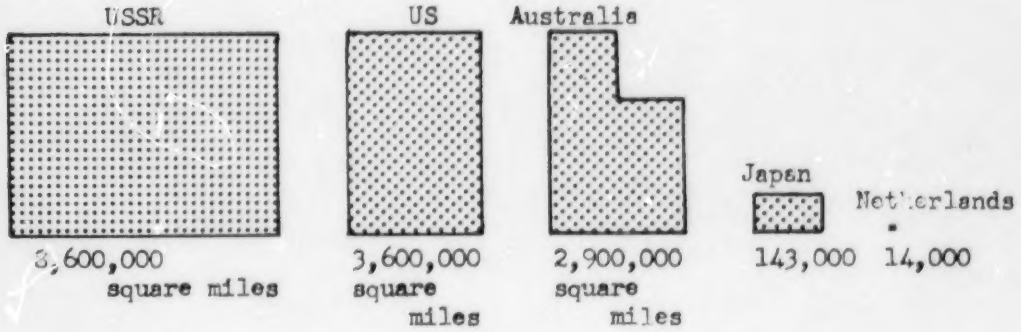
I can outline the Fertile Triangle and can compare it with the Corn Belt in the terms of the earth complex.

In this activity we shall discuss the Union of Soviet Socialist Republics (the U.S.S.R.). It is not correct to refer to the Soviet Union as Russia. Russia became the U.S.S.R. or the Soviet Union in 1917. The Soviet Union now includes much more than the area that was called Russia. The Russian region is part of the Soviet Union just as the Midwest is part of the United States.

Area

The U.S.S.R. has the largest area of any country in the world. The Soviet Union covers an area that is 2½ times larger than the United States. See the diagram below.

THE AREA OF 5 DIFFERENT COUNTRIES



a. Why is it not correct to refer to the Soviet Union as Russia?

b. Look at the diagrams above. Which country has about the same area as the United States?

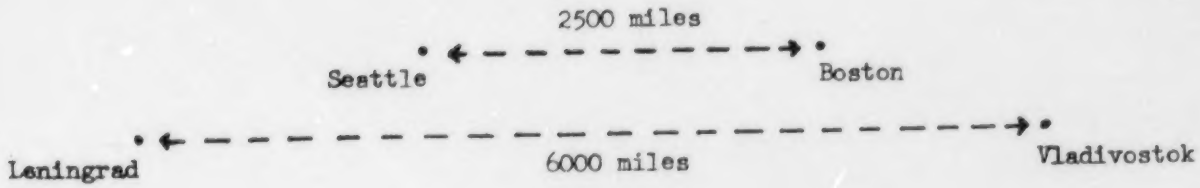
c. How does the Soviet Union compare in area with the United States?

d. Compare the area of Japan with the U.S.S.R. Japan has 102 million people and the Soviet Union has 243 million people. Do you think the population density in the U.S.S.R. is very high? Why not?

Look at the Soviet Union and the United States on a globe. Notice that the Soviet Union reaches almost halfway around the earth. How far does the United States stretch around the globe? Does it reach half the distance around the earth?

Locate the two cities of Boston and Seattle in the United States. Next locate the Soviet cities of Leningrad and Vladivostok. See the diagram below.

COMPARING DISTANCES IN THE UNITED STATES AND THE U.S.S.R.



a. How far is the distance from Boston to Seattle? How far is the distance from Leningrad to Vlodivostok?

b. If a jet airplane flies at 500 miles per hour, how long will it take to fly non-stop from Boston to Seattle? If it takes five hours to fly non-stop from Boston to Seattle, how long will it take to fly from Leningrad to Vladivostok?

The Earth Complex: Climate

The climate in the Soviet Union is somewhat like the climate in Canada. The Soviet Union and Canada are about the same distance north of the equator. Look at a globe and see this for yourself. Now look at the map below.

COMPARING DISTANCE NORTH OF THE EQUATOR

a. Is very much of the Soviet Union north of the boundary between the United States and Canada?

b. Would you expect the Soviet Union to be warmer or colder than the United States? Why is it colder?

c. Can you tell from the map whether the United States is larger or smaller than the Soviet Union?

The map on the other page shows the boundary of the 90-day growing season in the Soviet Union. Growing season refers to the number of days between the last frost of one winter and the first frost of the next winter. Frost kills fragile plants like tomatoes. Fruits such as oranges and apples are damaged by frost. Plants that are not killed or damaged by the cold are slowed down. About one-half of the Soviet Union is too cold to grow such crops as corn, soybeans, and alfalfa.

The U.S.S.R. is a huge land mass in the far north. The map on the other page shows that about one-third of the Soviet Union is affected by permafrost. Permafrost is ground that is frozen the year round. Permafrost creates many problems for farming, building, and drainage. Most areas with less than a 90-day growing season have permafrost. The United States has some permafrost in northern Alaska.

a. What is growing season? Does very much of the Soviet Union have a growing season of less than 90 days? How does a short growing season affect farming?

b. What is permafrost? How does permafrost make farming difficult?

c. Is permafrost a problem in the Corn Belt? Why not?

TEMPERATURE TABLE

	January Average	July Average	Yearly Average
New York, U.S.A.	30 degrees	72 degrees	52 degrees
Moscow, U.S.S.R.	10 degrees	64 degrees	39 degrees
Atlanta, U.S.A.	45 degrees	79 degrees	61 degrees

The table above shows climate data for the largest city in the Soviet Union and the largest city in the United States, which is located in the North, and a large southern city.

a. Locate Moscow, New York City, and Atlanta on a map. Is New York north of where you live? Moscow is north of where you live unless you live in Alaska. Is the yearly average temperature where you live warmer or colder than in New York?

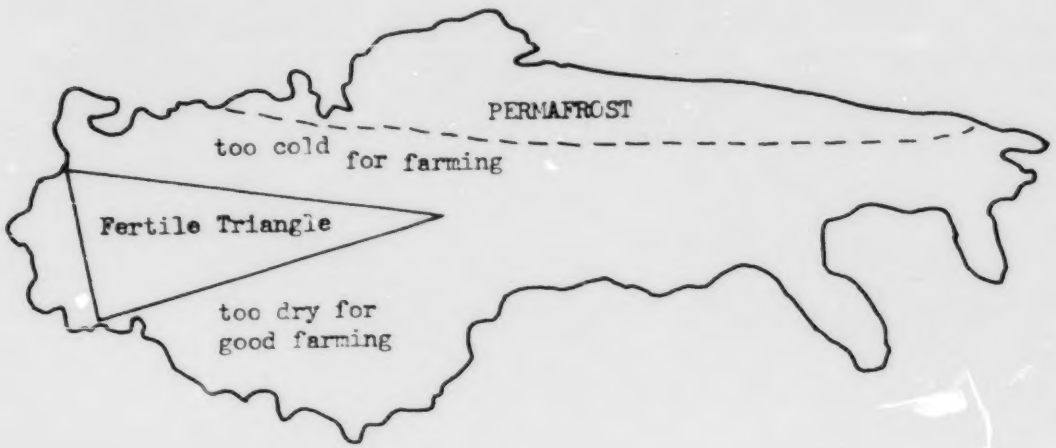
b. What month is the coldest in the 3 cities? Which city has the coldest January average? Is an average monthly temperature of 10 degrees very cold?

c. What is the average temperature in Moscow? Is Moscow a cold place in which to live?

The Fertile Triangle

The heart of the Soviet Union is the Fertile Triangle. The Fertile Triangle is to Soviet agriculture what the Corn Belt is to farming in the United States; these regions are the richest farm areas in the two countries. The Fertile Triangle has only 17% of the total area of the Soviet Union, but it contains more than 80% of the cropland. Most of the people live in the Fertile Triangle.

THE SOVIET UNION



a. What is the Fertile Triangle? How is the Fertile Triangle like the Corn Belt in the United States? Do 80% of the people in the United States live in the Corn Belt?

b. What factor limits the Fertile Triangle on the north? What limits it on the south?

The Soviet Union is a huge land mass with many different types of rural landscapes. See the model below.

RURAL LANDSCAPE MODEL

a. What factor of the Rural Landscape Model is shown above?

b. Can you compare the area of the United States and the Soviet Union? How much larger is the Soviet Union than the United States?

c. Can you relate the Fertile Triangle to the Earth Complex? What makes the Fertile Triangle a favorable place for farming?

THE SOVIET RURAL TRADITION: FROM COLLECTIVE FARMS TO STATE FARMS

14

Overview

Tradition is an important part of culture. Every country has its own farm tradition. The rural landscape reflects the farm tradition. The Soviets have altered the farm tradition in their country since 1917. They have changed the ownership of the cropland from private ownership to government ownership. In bringing the cropland under government ownership, they have made the farms into very large units. Farms in the Soviet Union are many times larger than family farms in the United States or sheep stations in Australia.

There are two types of farms in the Soviet Union. These are collective farms and state farms. State farms are larger and more modern than collective farms. The Soviets are trying to change the collective farms into state farms. Farms in the U.S.S.R. are the largest farms in the world.

The technology of state farms is more advanced than it is on collective farms. Collective farms depend on large inputs of muscle power. Collective farms have many workers and many work animals. State farms, in contrast, use machine power to replace farm workers. The Soviets are trying to make all farms into state farms.

THE SOVIET RURAL TRADITION:
FROM COLLECTIVE FARMS TO STATE FARMS

Terms I Need to Use: tradition
collective farm
brigade
state farm

Ideas I Must Explain:

I can explain how the collective farm is based on tradition while the state farm is related to modern technology.

I can explain how brigades and private plots are related to the collective farm system.

I can compare collective and state farms and can explain why the Soviets want to change from collective to state farms.

Tradition is the way people are used to doing things. Some examples of tradition in the United States are the family farm tradition, the neighborhood school tradition, the tradition of one family per house. A tradition is part of the culture. Traditions are not easy to change.

Two Farm Types

There are two types of farms in the U.S.S.R.--the collective farm and the state farm. The Soviets are trying to change from collective farms to modern state farms. We shall learn about these two types of farms.

a. What is a tradition? How is the family farm a tradition in the United States?

b. Is the English language a tradition in the United States? Would it be easy to change? Why not?

Collective Farms

A collective farm is a large farm with many workers. Workers on the collective farms in the Soviet Union are not paid a regular cash wage. Instead, they receive a share of the profits based on the number of days they work on the collective.

Russia became the Soviet Union after the Revolution in 1917. Farm land in the Soviet Union was changed from private ownership to public ownership after the Revolution. The small peasant landholdings were put together into collective farms. The workers on the collective farms stayed in their old villages but worked on the collective farms. Even today, collective farm workers in the Soviet Union are usually unskilled people who live in small farm villages. Most collective farm workers are very poor.

Workers on collective farms work together in groups. Each person belongs to a work brigade. A brigade is a large work group that does a special task on the collective. There are planting brigades, plowing brigades, and milking brigades. The brigade depends more on muscle power than on machine power. Collective farms depend on the labor inputs of many people and animals (horses).

a. What is a collective farm? How are the workers paid on a collective farm?

b. Who owns the land on a collective farm?

c. What is a brigade? Do the brigades depend on muscle power or machine power?

Private Plots

Collective farm workers are not paid a cash wage. Instead, they get money by selling the products from their private plots. A private plot is a small area that each family can farm and sell the products in town. Private plots range from one-half acre to two acres. Private plots are an important source of money for the collective farm workers. The private plots are used to produce eggs, fruit, potatoes and milk. Hogs, cattle, and poultry are kept on the private plots. It is interesting that the small private plots grow higher yields per acre than the huge collective farms! This happens because the workers take better care of their own private plots than they do of the collective farm. Private plots are important to city people because they can buy vegetables, meat, and fresh milk at the collective markets in the city.

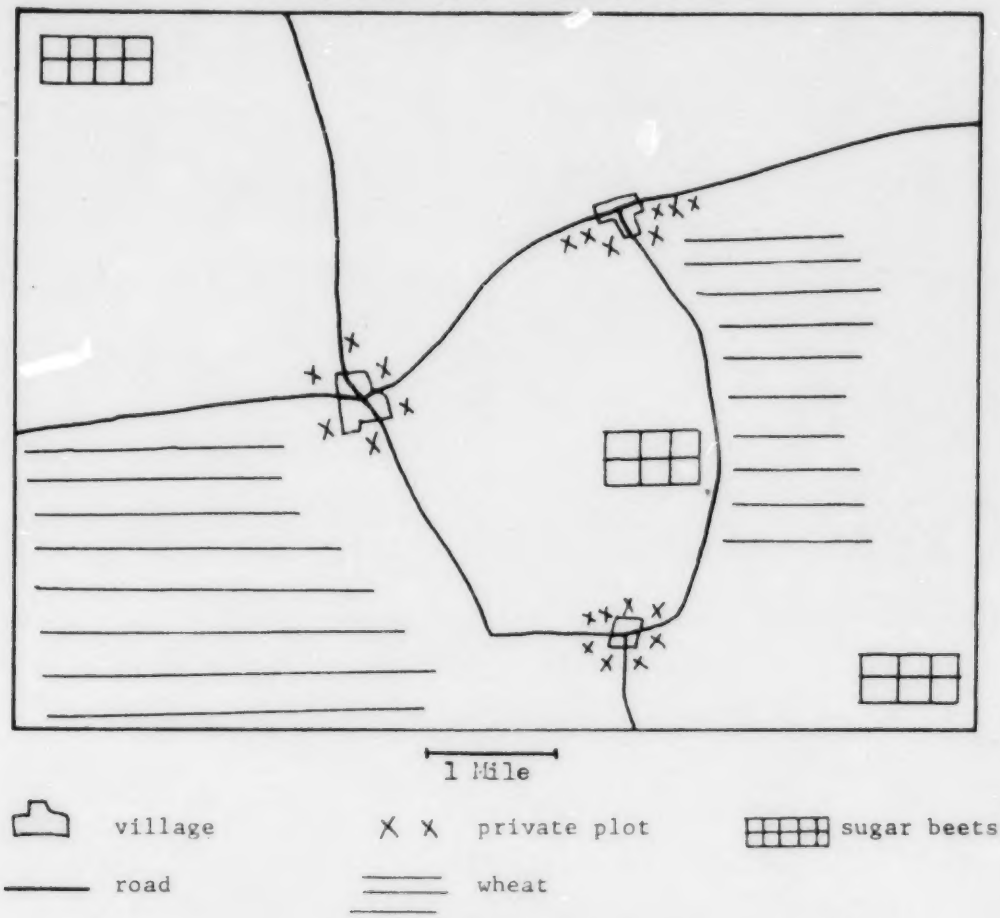
a. What is a private plot? What happens to the products from the private plots?

b. Why are yields from the private plots higher than average yields from the collective farms?

c. How do the private plots help both the collective workers and the city people?

The map below shows a collective farm. One collective farm is often made up of several villages. An average collective farm is very large. The farm below covers more than 20 square miles (about 16,000 acres), and has 400 families. An average collective farm has about 1200 workers. The fields are very large. Notice the private plots. Study the map below.

A COLLECTIVE FARM IN THE U.S.S.R.



a. How many villages are on the collective farm above? How far apart are the villages?

b. What is the map symbol for private plots? Why are private plots found near every village?

c. What crops are grown on the collective farm according to the map legend? What happens to the crops and animals that belong to the collective farm? What happens to the products of the private plots?

State Farm

State farms in the U.S.S.R. are even bigger than collectives. Unlike collective workers, the workers on state farms are paid in cash every two weeks. Workers on state farms are more skilled, better trained, and higher paid than collective farm workers. State farm workers live in new buildings on the state farm rather than in the old villages. Instead of several small villages, the state farms have one large village that is new and modern. There are no private plots on state farms.

State farms are a type of rural factory. The Soviets are trying to replace collective farms with state farms. They want to do away with hand labor and work animals.

The data table below compares state farms and collectives. See below.

TWO TYPES OF SOVIET FARMS

	COLLECTIVE FARM	STATE FARM
SIZE	16,000 acres	60,000 acres
POPULATION	2,700 people	600 people
TECHNOLOGY	12 tractors	65 tractors
	460 work animals	80 work animals
LANDSCAPE	separate villages	one large village
PATTERN	many private plots	no private plots

a. Look at the data table above. One farm is a collective; the other is a state farm. Which farm has the most acres? The most workers?

b. How can the state farm have twice the acres of the collective and less than half as many workers?

c. Why are there no private plots on the state farm?

d. Which farm uses more machine power technology? Why do the Soviets want to change from collective to state farms?

e. How are workers paid on a state farm?

f. Do you think the workers on the collectives work hard? Why? Do they produce very much per hour of labor? Why not?

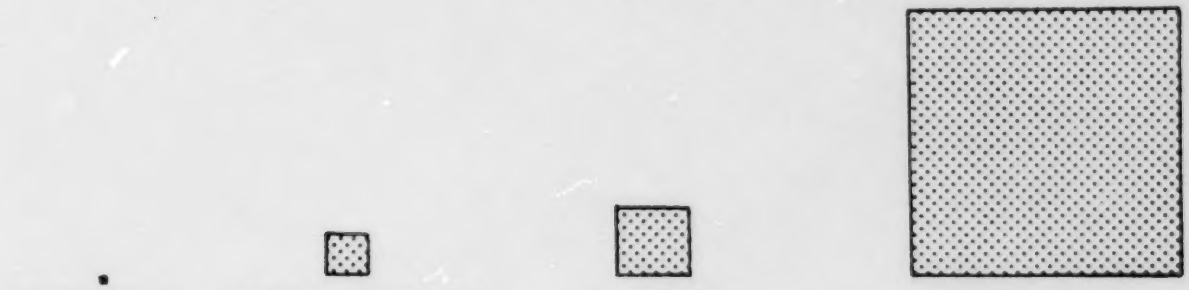
Soviet farms are not like farms in the United States. There are no family farms in the Soviet Union. Since cropland in the Soviet Union is owned by the government, the people who work on the collective and state farms do not own the land where they work.

a. Why are there no family farms in the Soviet Union?

b. Do the workers on a Soviet state farm own the land they farm? Who does own the land?

Study the diagrams below. They help you to compare the farm size in four countries which you have studied.

AVERAGE FARM SIZE IN 4 COUNTRIES



Netherlands family farm 10 acres

United States family farm 400 acres

Australia sheep station 1,000 acres

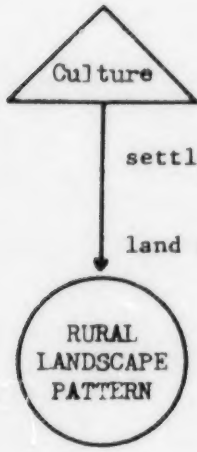
U.S.S.R. collective farm 16,000 acres

a. Are Soviet collective farms larger or smaller than family farms in the United States?

b. What are some other ways that Soviet farms differ from farms in the United States?

Study the Model below.

RURAL LANDSCAPE MODEL



	United States	U.S.S.R.
settlement pattern:	family farm	village pattern (cluster)
land ownership:	private	public

a. Which factor of the Rural Landscape Model is shown above?

b. Can you compare the settlement pattern in the United States with that in the U.S.S.R.?

c. How does rural land ownership differ in the two countries?

FARM TECHNOLOGY IN THE U.S.S.R.

15

Overview

Farm technology in the Soviet Union is not as modern as it is in the other countries we have studied. Soviet farms use more muscle power than farms in the United States. Since the Soviets need many people for farm work, almost half the workers in the Soviet Union are farm workers. In the United States less than 5% of the people are farm workers.

Railroads are very important in the Soviet Union. Most Soviet crops are carried by railroad. Rather than build trucks and super highways, they have chosen to build a modern railway system. It is important to remember that the distances across the Soviet Union are very great.

The Soviets have tried to expand the farming area of their country. They have opened up an area in the dry southeastern part of the country for farming. These new croplands are the Idle Lands Program. The farms in the Idle Lands Program are state farms with very modern farm machinery. The new state farms depend on machine power technology.

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FARM TECHNOLOGY IN THE U.S.S.R.

Terms I Need to Use: transportation system (network)
transportation model
Idle Lands Program

Ideas I Must Explain:

I can explain why 45% of the Soviet people are farmers and only 5% of the people in the United States are farmers.

I can explain how one farm machine can replace many farm workers and work animals.

I can explain why the Soviets depend on the railroad system more than the United States.

I can explain why the Idle Lands Program is dependent on mechanized agriculture and railroads.

The Number of Farm Workers

Almost half the people in the Soviet Union are farm workers. One Soviet farm worker grows enough food to feed three people. In contrast, one farm worker in the United States grows enough food for 40 people.

In the pie charts below the shaded (dark) area represents the percentage of the total population who are farmers. Compare the U.S.S.R. with the other countries we have studied.

U.S.S.R.	JAPAN	AUSTRALIA	THE NETHERLANDS	U.S.
45%	30%	10%	6%	5%

a. In the charts above which country has the highest per cent of farmers? Which has the lowest per cent of farmers?

b. Why is it that almost half of the people in the Soviet Union are needed to grow food?

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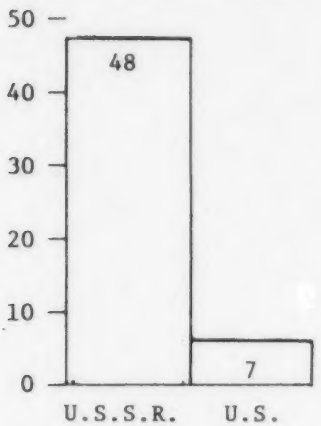
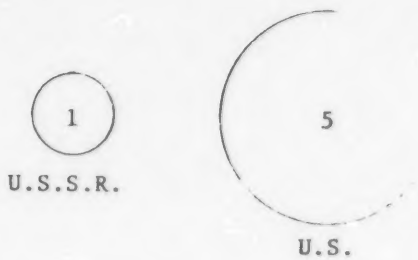
Soviet farms use more muscle power (human and animal) than farms in the United States. Look at the graphs below representing the data for 1968.

FARM WORKERS
(in millions)



TRACTORS
(in millions)



a. What two variables are shown above?

b. Look at the circle graphs showing tractors. Which country has the most tractors?

c. Look at the graphs showing farm workers. Which country has the most farm workers?

d. Does the country with the most tractors also have the most farm workers? What is the relationship between tractors and farm workers?

e. The graphs show that farms in the United States tend to use machine power rather than muscle power. Which country has the most advanced technology? Why?

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Transportation in the U.S.S.R.

Railroads are very important in the U.S.S.R. for two reasons. (1) The distance between places is very great. The Soviet Union is 6000 miles across, and 2500 miles from north to south. (2) The Soviet Union has no long-distance highway network. The Soviets have not built a national highway system like our interstate highways. Nearly all goods and people in the Soviet Union move by railroad.

The Soviets do not have a well-developed highway network. They do not depend on cars or trucks. See the data table below.

	Passenger cars	Trucks
U.S.S.R.	1 million	60 million
U.S.	3 million	12 million

a. What is the means of transportation that is most important in the Soviet Union?

b. Look at the data table above. Which country has the most cars and trucks? Would you expect the Soviet Union to have more railroad cars than the United States? Why?

c. The Soviet Union has 1 car for every 200 people; the United States has 1 car for every 4 people. The Soviets have recently started to build more cars. Do you think they will have to build more roads and highways? Why?

The Idle Lands Program

In the past few years a large area in the southeastern Soviet Union has been planted to crops. The Soviets call this project the Idle Lands Program. Wheat is the major crop in the Idle Lands Program because it will grow in a dry climate.

The Idle Lands Program was made possible by two factors of modern technology--big farm machines and railroads. The big machines such as tractors, grain combines, and grain drills allow the Soviets to plow up large areas of uncultivated land and plant them to crops. The crops are carried by railroad to the cities of the Fertile Triangle where most of the people live. Railroads connect the new farms in the Idle Lands with other parts of the country.

The new farms of the Idle Lands Program are nearly all state farms. They are huge, covering many square miles. These new state farms plant grains that grow well in dry areas--wheat, rye, barley. Nearly all the work is done by machine. The workers live in new villages on the farms. There are no private plots because the workers are paid a regular cash wage. See the map below.

THE IDLE LANDS PROGRAM IN THE U.S.S.R.

a. What is the Idle Lands Program? What crops are grown in the Idle Lands Program? Why is corn not grown?

b. How is the Idle Lands Program related to modern technology? What would happen if all the machinery would break down at once? Do the farms have enough people to do the labor with only muscle power? Why not?

c. Is the Idle Lands Program inside the Fertile Triangle?

d. Are the farms of the Idle Lands Program state or collective farms? Do the workers live in old villages? Are there private plots?

e. Could the Idle Lands Program exist without modern technology? Why not?

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The rural population density in the U.S.S.R. is higher than that in the United States. There are more people in the rural areas of the Soviet Union because almost half of the Soviet people are farmers, but only 5% of the people in the United States are farmers.

Do not confuse the rural population density with the average population density. The rural density refers to the farm areas. The average density refers to the entire country, including the cities.

a. Why is the rural population density higher in the Soviet Union than it is in the United States?

b. How does the average population density of a country differ from the rural population density?

Study the Model below.

RURAL LANDSCAPE MODEL

The USSR has a higher rural population density than the United States.

United States	USSR
- many farm machines and almost no work animals	- farm machines with many work animals
- many farm trucks and paved roads	- few paved roads, few farm trucks, and heavy use of railroads
- 1 farm worker grows food for 40 people	- 1 farm worker grows food for 3 people

a. What two ideas in the Rural Landscape Model are shown above?

b. Why do the Soviets depend more on trains than we do in the United States?

c. If you were to travel across the Soviet Union, how would you travel? Do they have super highways?

COMMERCIAL PLANTATION FARMING IN THE WET TROPICS

16

Overview

The earth complex in the wet tropics allows the vegetation to grow all year in the rainforest. There is no winter in the rainforest. The climate is hot and wet.

Many commercial farms in the wet tropics are large plantations. The crop tradition for most tropical plantations is to specialize in one crop for export. Examples of tropical plantation crops are rubber, coffee, cocoa, and bananas.

The population density in tropical rainforests is usually very low. However, near the big commercial plantations the population density is high because many workers are needed.

The labor on tropical plantations is mostly done with muscle power technology. Many workers are needed to harvest the plantation crops.

COMMERCIAL PLANTATION FARMING IN THE WET TROPICS

Terms I Need to Use:
- commercial farm
- tropics (wet and dry)
- commercial plantation
- tropical rainforest (selva)
- monoculture

Ideas I Must Explain:

I can describe a tropical rainforest and explain how the rainforest (selva) presents problems for farming.

I can explain why tropical crops are grown for sale in non-tropical countries.

I can list some tropical plantation crops and can explain which countries specialize in specific crops.

I can explain why tropical plantations are usually monocultural.

I can explain why there are no livestock in a rainforest.

Climate

The tropics are near the equator. There are dry tropics and wet tropics. Look at a world map or a globe and find the Tropic of Capricorn and the Tropic of Cancer. The area between these two lines is the tropics. Another way to say "tropics" is to use the word "equatorial." There is no winter in the tropics.

a. Do you live in the tropics?

b. Is there a winter where you live?

LOCATION	AVERAGE TEMPERATURE		AVERAGE ANNUAL RAINFALL
	January	July	
Menaus, Brazil	79 degrees	80 degrees	70 inches
Moscow, U.S.S.R.	10 degrees	64 degrees	22 inches
New York, U.S.A.	30 degrees	72 degrees	40 inches
Atlanta, U.S.A.	45 degrees	79 degrees	56 inches
Tokyo, Japan	37 degrees	77 degrees	58 inches

As you can see by the data table above, the tropics (Menaus, Brazil) is warm all year round. It is almost like growing crops in a greenhouse since it never freezes. Study the table above. Locate the 4 cities above on a world map or a globe.

The term "rainforest" is misleading because temperature--not rain--is the most important factor in the earth complex of a rainforest. Look at the table above. Notice that the rainfall for Atlanta and Tokyo is almost as high as that of Menaus.

The difference between the January and the July temperatures is the temperature range. For example, the temperature range in New York is 42 degrees (30 subtracted from 72 is 42). Find the temperature ranges for the other places.

City	Temperature Range
Menaus, Brazil	_____ degrees
Moscow, U.S.S.R.	_____ degrees
New York, U.S.A.	42 degrees
Atlanta, U.S.A.	_____ degrees
Tokyo, Japan	_____ degrees

a. Is there a cold season at Menaus? Is there a cold season in the other cities? Will crops grow the year round in the other cities?

b. Why would you expect to find a rainforest at Menaus after looking at chart above?

Farming in the Wet Tropics

A commercial farm is a farm that grows crops for sale. Nearly all farms in the United States are commercial farms. A commercial farm in the wet tropics is a plantation.

A plantation is a very large commercial farm that grows crops for sale in other countries. The important tropical plantation crops are rubber, coffee, tea, bananas, sugar cane, cocoa, coconut, and pineapple. Most tropical plantation crops are exported from the countries where they are grown and carried by ship to the countries where they are bought. The general pattern is for plantation crops to move from the poor tropical countries near the equator to the more wealthy countries of North America and Europe.

a. What is a commercial farm?

b. How is a tropical plantation a commercial farm?

c. What happens to the crops that are grown on tropical plantations?

Plantation farmins is usually found in the tropical rainforest where the vegetation is so thick one cannot easily walk along the ground. Besides having heavy undergrowth, rainforests in the wet tropics have three layers of vegetation. There is the heavy undergrowth on the ground, the climbing plants, and the very tall trees that block off the sunlight. Another term for tropical rainforest is selva. A common but incorrect term is jungle. We shall use rainforest or selva rather than jungle. The drawing below shows how the selva is made up of layers of vegetation.

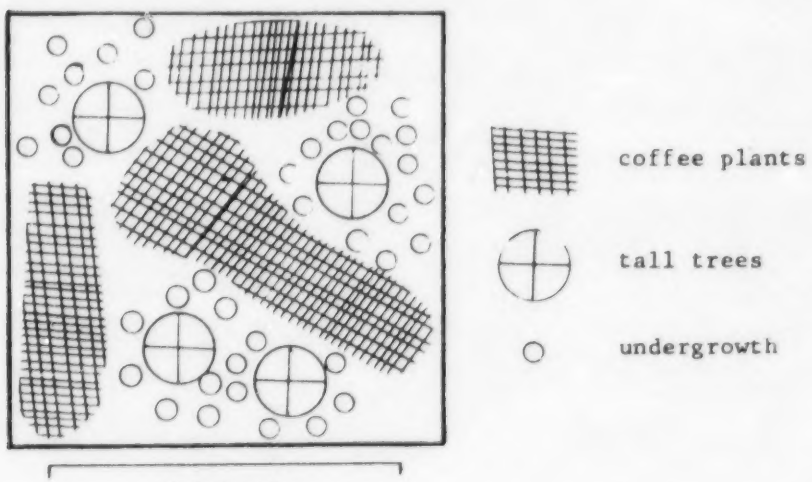
a. What is another term for rainforest?

b. Why is it almost impossible to walk through a tropical rainforest?

c. Even though the sun is shining, why is it often difficult to see the sun in a selva?

Farming in the rainforest is very difficult. The farm plots are not like fields in other regions. Since it is almost impossible to kill the big hardwood trees, farm plots in the rainforest are not completely cleared as fields in other regions are. In the tropics much of the undergrowth is left and the people farm around it. The growing areas are small and have many different shapes. See the map below.

FARM PLOT IN THE WET TROPICS



a. Look at the map above. The map shows an area that is about the size of a football field. What crop is grown in the farm plot above?

b. Is the field carefully cleared of all big trees and undergrowth? Why not?

A Monocultural Crop Tradition

Tropical plantations tend to grow one crop for export. Most plantations in the wet tropics are monocultural--they specialize in one crop. In Cuba and the Philippines the plantation crop tradition is sugar cane. Ghana in West Africa grows cocoa for chocolate on its plantations. Tea is an important plantation crop in India and Ceylon. The plantation crop tradition in Brazil is coffee. Bananas are the crop tradition on plantations in Central America. Pineapple is the main crop in Hawaii.

a. Which countries or regions specialize in the following tropical crops:

coffee _____

bananas _____

cocoa _____

sugar cane _____

tea _____

pineapple _____

b. What is meant by the saying that most plantation farming is monocultural?

Population Density

The population density in tropical rainforests is usually very low. It is not easy to make a living by farming in the rainforest. The soils are poor and the plants grow up very quickly and choke the crops. The population density is higher near plantations, however, because many workers are needed on the plantations. In fact, the plantations are often islands of high population density surrounded by selva where very few people live.

a. Why is the average population density in rainforests very low?

b. Why is the population density at plantations higher than in the surrounding rainforest?

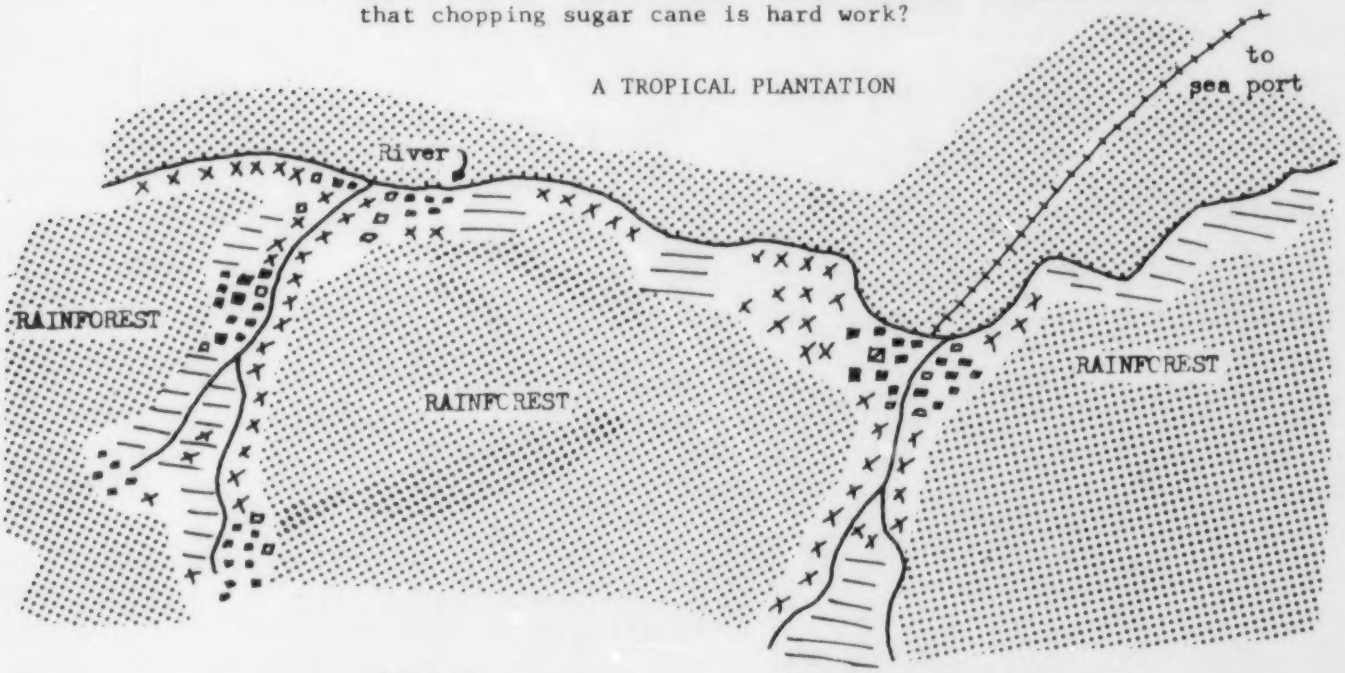
The labor on tropical plantations is usually done by **muscle power**. Many workers are needed to clear the forest, plant, tend, and harvest the crops. The hoe and the machete are important tools. Both are hand tools.

Many workers are needed to harvest the crops on plantations. The schools in Cuba are let out and offices are closed so that everyone can work in the sugar cane harvest. Sugar cane is chopped by hand with a machete. Many people are needed to harvest one acre of sugar cane. The other crops such as pineapple, coffee, cocoa, and rubber are harvested by muscle power also.

a. Is tropical plantation farming usually based on muscle power or machine power?

b. Why are many workers needed at harvest time? Do you think that chopping sugar cane is hard work?

A TROPICAL PLANTATION



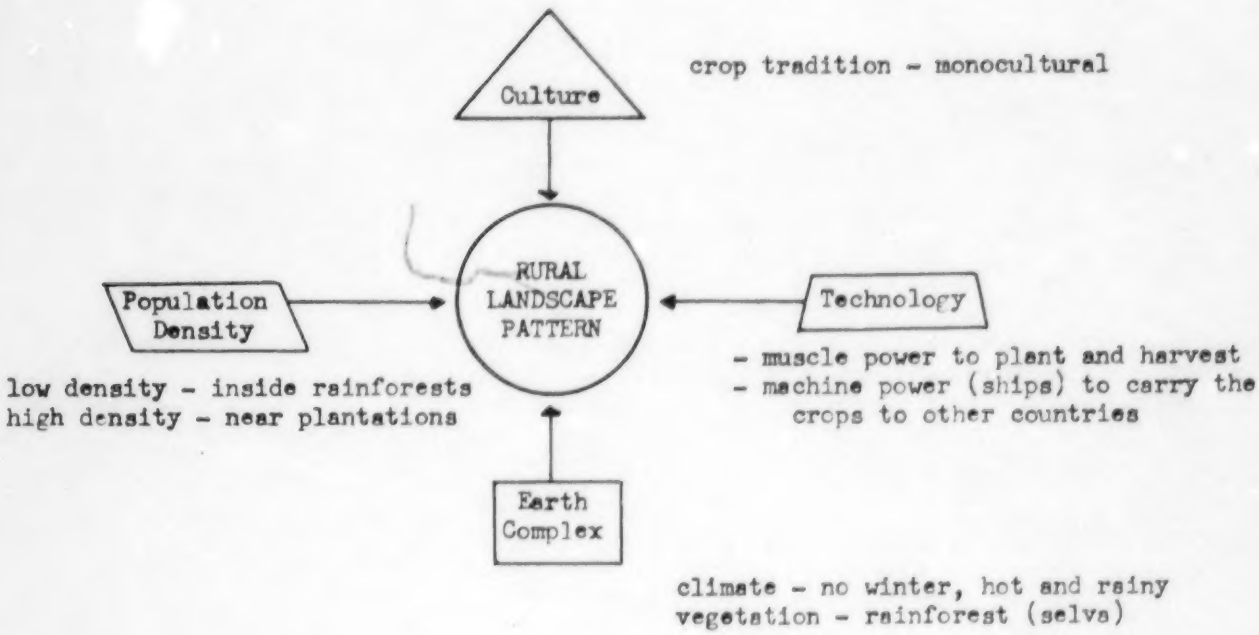
a. What crops are grown on the tropical plantation in the map above?

b. Where does the railroad go? Why is the plantation connected to a port? Why are the foods we get from tropical plantations very costly per pound?

c. Why are the areas away from the rivers left in rainforest? Would it be easy to walk through the rainforest? Why not? Do people live in the rainforest away from the rivers? Why not?

The Model below shows the key ideas in tropical plantation farming.

RURAL LANDSCAPE MODEL


Culture
crop tradition - monocultural
RURAL LANDSCAPE PATTERN
Population Density
low density - inside rainforests
high density - near plantations
Technology
- muscle power to plant and harvest
- machine power (ships) to carry the crops to other countries
Earth Complex
climate - no winter, hot and rainy
vegetation - rainforest (selva)

a. Which of the four big ideas in the Rural Landscape Model are shown above?

b. What is monocultural plantation farming?

c. Is plantation farming based on muscle power or machine power?

d. What is the advantage of not having a winter in the tropics?

e. Can you describe a tropical rainfroest?

f. Is the population density inside a rainforest usually high or low? Why is it low?

ITURI PYGMIES:
SUBSISTENCE HUNTERS AND GATHERERS IN CENTRAL AFRICA

17

Overview

One group of pygmies lives in the Ituri Forest in the Congo Basin. The Congo Basin is a huge rainforest in Central Africa.

The earth complex greatly affects the way of life in the rainforest. The rainforest vegetation grows up very quickly. It is difficult to walk through a rainforest because the undergrowth is so thick.

The Ituri Pygmies have no crop tradition because they are not farmers. They are subsistence people who travel through the rainforest and gather berries, wild bananas, mushrooms, and forest honey.

The population density in the Ituri Forest is low. It is very difficult for subsistence gatherers to make a living in a rainforest.

The Pygmies have no machines. They use very simple hand tools. They rely on muscle power technology.

ITURI PYGMIES:
SUBSISTENCE HUNTERS AND GATHERERS IN CENTRAL AFRICA

Terms I Need to Use: rainforest (selva)
hunting band
subsistence hunting and gathering
plantain

Ideas I Must Explain:

I can describe a selva and explain why the population density there is very low.

I can identify three areas of tropical rainforest in the world and can locate the Ituri Forest where the Pygmies live

I can define a hunting band and can explain why Ituri Pygmy hunting bands move from camp to camp and do not live in fixed villages.

I can define subsistence and can explain how rural subsistence people differ from rural commercial people.

I can explain why subsistence people depend on muscle power rather than machine power.

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We have learned that rainforests (selvas) are found in the wet tropics near the equator. Within the selva one feels shut-in because the vegetation is very thick. The selva is gloomy because the tall trees block the sunlight before it reaches the ground. Plants grow all year in the rainforest where there is neither a winter nor a dry season.

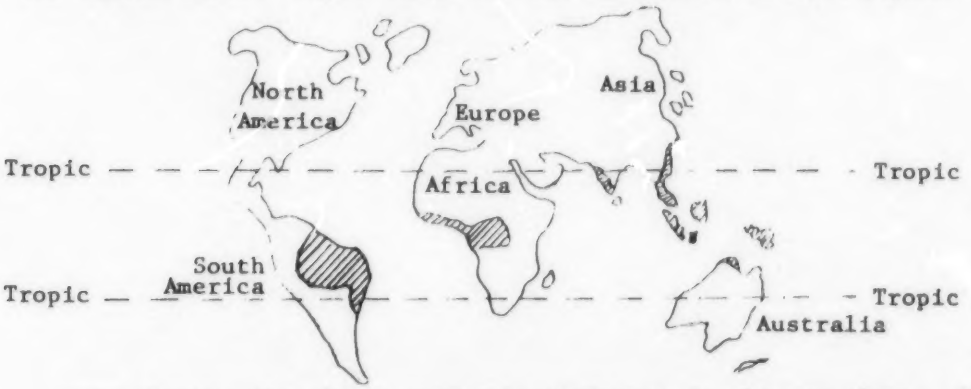
Vegetation grows very fast in the selva. The speed of vegetation growth can be shown by cutting a clearing in the rainforest. In a very brief time--a few weeks--the clearing grows up into a heavy tangle of plants.

a. Why is it wet and gloomy during the day on the ground in a rainforest?

b. Why is the rainforest always green?

c. Why do plants grow so fast in a rainforest? Why does rapid plant growth make farming difficult in the wet tropics?

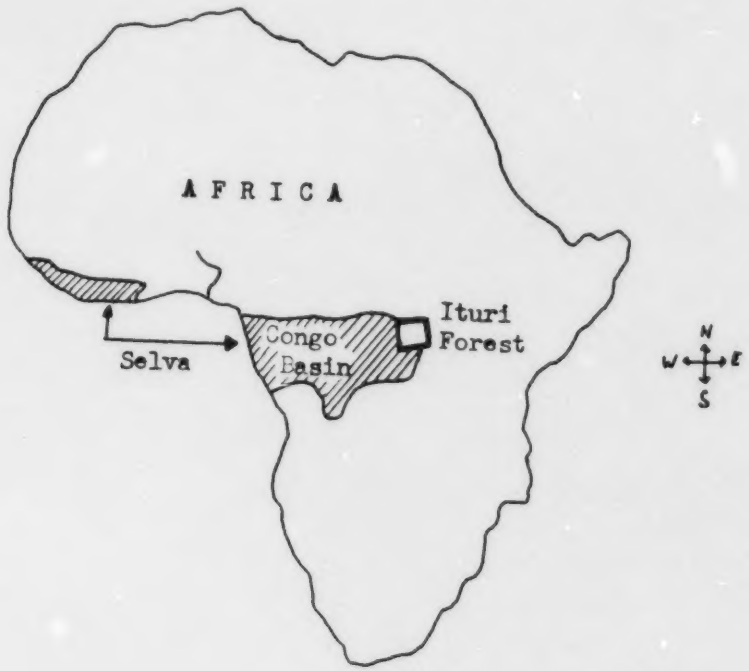
The shaded areas in the map below show the three main areas of tropical rainforest in the world. Notice that they fall inside the two Tropic lines. These lines are the boundaries of the tropics.



a. Locate the three areas of rainforest in the map above. Why are they near the equator? Do you live in or near a selva? Why not?

b. Identify the Amazon rainforest in Brazil, the rainforest in Southeast Asia, and the rainforest in Central Africa.

The map of Africa below shows the Congo Basin rainforest and the Ituri Forest. The Ituri Forest is part of the Congo Basin in the Republic of the Congo.



a. Look at the map of Africa above. Is the Ituri Forest easy to get to? Why not?

b. Would you expect the Ituri Forest to have a high <u>population density</u>? Can you give reasons why the Ituri Forest has a low population density?

Hunting Bands

Some of the people in the Ituri Forest are pygmies. Pygmies are small people who live in hunting bands. A hunting band is a group of as many as 30 families, about 100 people in all. Hunting bands move from place to place in the selva. Pygmy hunting bands live in camps that are made up of small huts that can be built in a few hours. The Ituri Pygmies live in small hunting camps rather than fixed villages. They prefer to live deep in the selva where they can hunt and gather.

The Ituri Pygmies are hunters and gatherers. Instead of making and selling goods, they get their living from the rainforest. Since they do not sell goods, money is not important in their culture. The Ituri are subsistence people rather than commercial people. Subsistence people get their living from the land and do not buy and sell goods with money.

a. What is a hunting band?

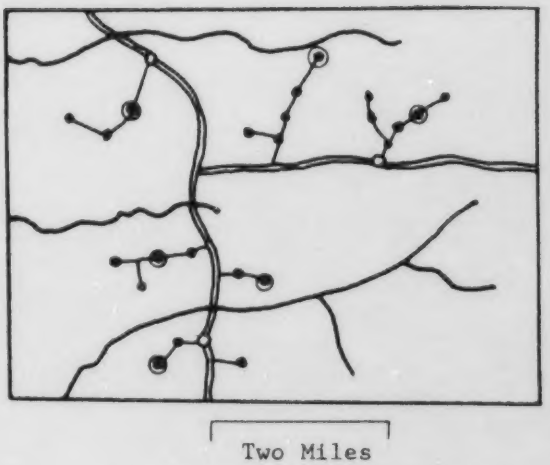
b. How do the Ituri Pygmies get their living? Do they live in villages and grow their food? Why not? Do they buy their food from the villagers? Why not?

c. Why is money not important in the Ituri Pygmy culture?

d. How do subsistence people differ from commercial people? Are you commercial or subsistence? (Hint: Do you grow, gather, or hunt all your food? Do you make all your clothes?

ITURI FOREST

- Pygmy camp sites
- Populated Pygmy camps
- Villages
- Roads
- Forest Paths
- Rivers



a. On what continent is the Ituri Forest? What country is it part of?

b. What are the map symbols for camp sites and villages? What is the difference between the "Pygmy camp sites" and the "Populated Pygmy camps"? Does every camp site have people living in it?

c. Are there more populated Pygmy camps or more villages? Do more people live in one camp than in one village?

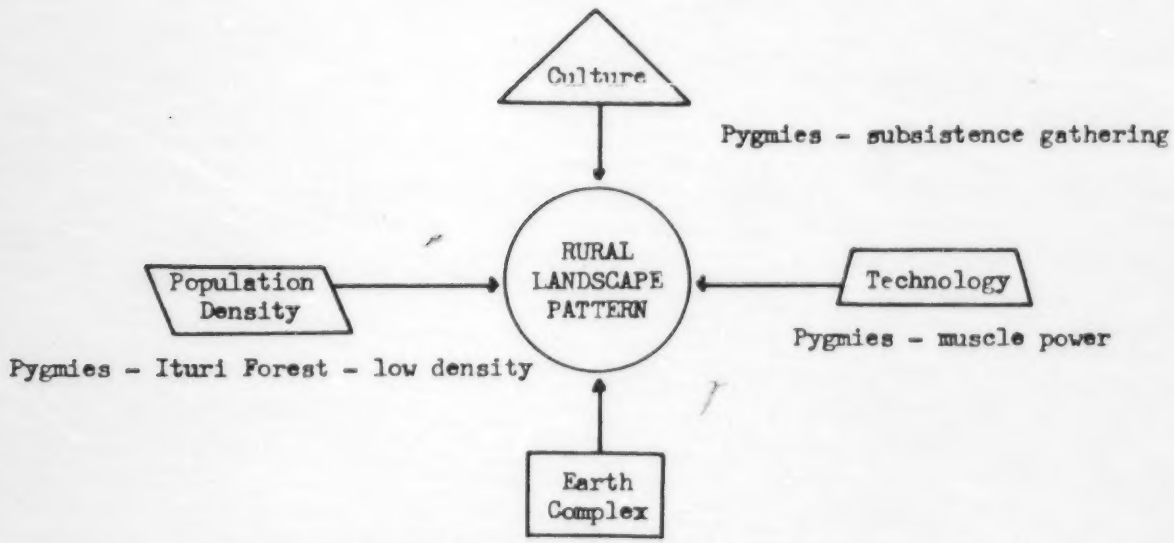
d. The map shows 3 types of transportation routes--rivers, forest paths, and narrow dirt roads. What are the map symbols for each type of route? Notice that the villages are linked by roads. How are the camps connected? Since the Pygmies travel on the forest paths, do they depend on muscle or machine power?

The Pygmies live in small camps in the selva and get their living by hunting and gathering. They hunt animals such as forest antelope and birds. They gather mushrooms, plantains (wild bananas), forest honey, and berries. The Pygmies prefer to stay deep in the forest away from the farmers who live in the villages.

a. What are plantains?

b. Why don't the Pygmies live in fixed villages like farmers?

RURAL LANDSCAPE MODEL



a. What type of forest is the Ituri Forest where the Pygmies live? Why do they travel through the forest on rivers and paths?

b. Which two of the following describe a rainforest:

_____ hot _____ dry

_____ cold _____ wet

c. Do the Pygmies use muscle power or machine power? Why do they have no need for tractors and bulldozers?

d. Since the Pygmies are subsistence people, how do they get their food? Are there any subsistence people in the United States?

MAN MODIFIES THE EARTH

18

Overview

Man alters the landscape so that he can increase the population density on the land. Nearly every landscape in the world is man-made or cultural. Some of the old or traditional methods man uses to alter the landscape are fire, cultivation, and deforestation. Every culture alters the landscape.

The old methods of altering the landscape have been improved by modern technology. Machine power technology has affected culture. Man uses machine power technology to build highways, dams, and big buildings in cities. Man changes the landscape wherever he lives.

MAN MODIFIES THE EARTH

Terms I Need to Use: deforestation
reforestation
cultivation
natural landscape
urbanization

Ideas I Must Explain:

I can explain that man is the most important influence on the landscape.

I can define a natural landscape and can explain that nearly every landscape on the earth has been altered by human action.

I can list and explain several ways that man alters the landscape.

I can explain why, in general, the higher the population density the more people change the landscape.

I can explain that three of the four ideas in the Rural Landscape Model are man-made ideas and only one (earth complex) is natural.

Man modifies (changes) the surface of the earth to fit his needs. Man builds many different landscapes such as farms, roads, and cities. Wherever man lives, he alters the landscape.

We sometimes think of natural landscapes. A natural landscape is an area on the earth that is completely unchanged by human action. The only true natural landscapes are the unpopulated areas such as high mountains, deserts, Antarctica, and northern Greenland. A natural landscape refers to an earth complex that is untouched by human action.

a. What is a natural landscape?

b. Why does man alter the natural landscape?

c. Why are there so very few natural landscapes in the world?

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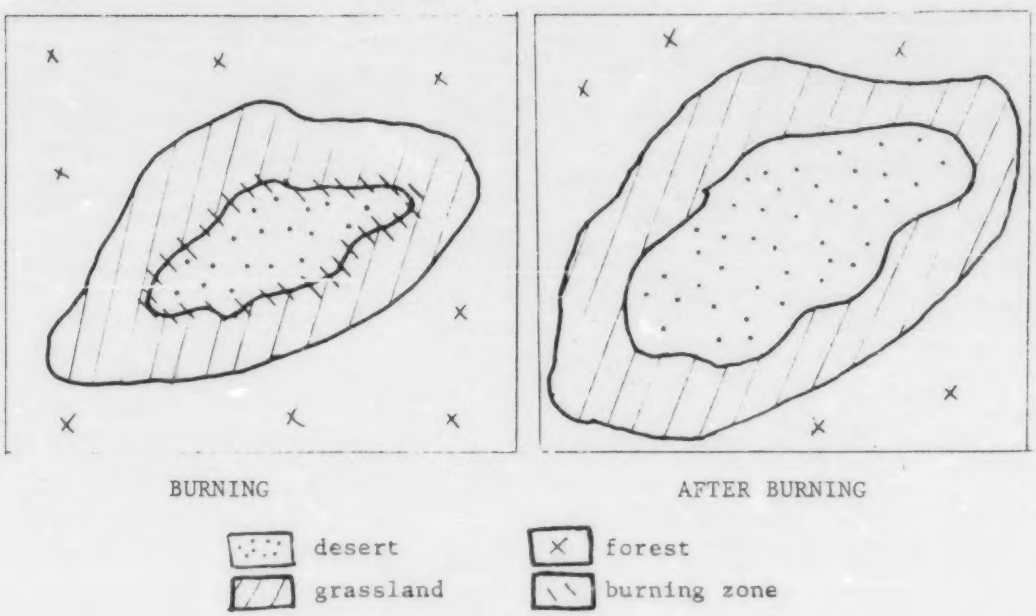
Man alters the landscape in several ways. Let us discuss these separately.

1. Fire. Burning greatly changes the landscape. After burning, a forest is often replaced with a grassland. It is believed that the great Sahara in north Africa is a larger desert today than it was two thousand years ago because of human burning around the edges. The Great Plains grassland of North America became bigger because the American Indians, and later the settlers, butned off the forests. The Indians set big fires to drive game such as buffalo. Burning makes grasslands and deserts grow larger. See the drawing below.

BURNING ALTERS THE LANDSCAPE



a. What two zones increased after burning? What zone decreased?

b. How do the drawings suggest that perhaps deserts are partly man-made?

c. What happens to the population density when the landscape becomes a desert? Can a desert support as many people as a grassland or a forest? Why not?

2. Cultivation. Cultivation is the planting, care, and harvesting of plants by people. Farmers are cultivators. Cultivation occurs on small plots that man cares for. Nearly all of our food comes from crops that have been cultivated by people on the land. A cultivated landscape is a changed landscape.

a. Why can a cultivated landscape support a higher population density than a natural landscape?

b. How does man use machine power technology to create a cultivated landscape?

3. Deforestation. Deforestation is the cutting down of forests to get rid of them. Forests block easy movement across an area. Forests also stop cultivation. For many years the settlers in the United States viewed forests as "The Enemy" and cut them down. Large areas of Ohio, Indiana, and Michigan were deforested by settlers who wanted to cultivate the lands.

Today man views forests as valuable. He knows that it takes many years to grow a tree, but only a few minutes to cut it down. In the United States we create National Parks to preserve large areas of natural landscape. There is an attempt in the United States to replace every tree that is cut down with another tree. The process of planting trees in areas that were once forested is reforestation.

a. Why did the early settlers cut down the forests?

b. Why do we no longer think of forests as "The Enemy"?

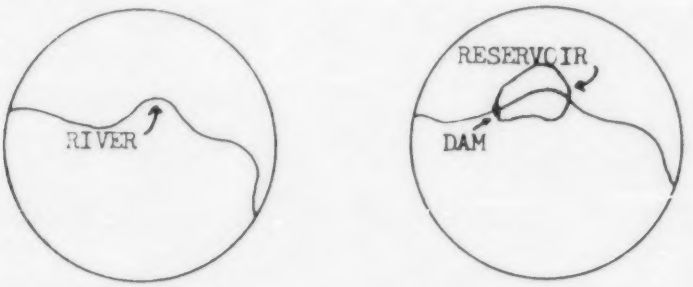
c. What is the difference between deforestation and reforestation? Why do both practices create man-made landscapes rather than natural landscapes?

4. Earth-Moving Machines. Earth-moving machines such as power shovels and bulldozers are used to alter the landscape. Power shovels carve great holes in the earth. Man often uses huge power shovels to mine coal and other minerals and metals at the surface of the earth. Rollers, bulldozers, and other machines are used to build highways and buildings, changing the landscape.

a. Why is a gravel-pit a man-made landscape?

b. How does machine technology alter the landscape?

5. Dams. Man builds dams across the rivers to control floods and to store water for irrigation. A dam stops the water, causing the water to form a reservoir behind the dam. A reservoir is a man-made lake. See the diagram below. It shows how a dam alters the landscape by creating a reservoir.



Before the dam After the dam

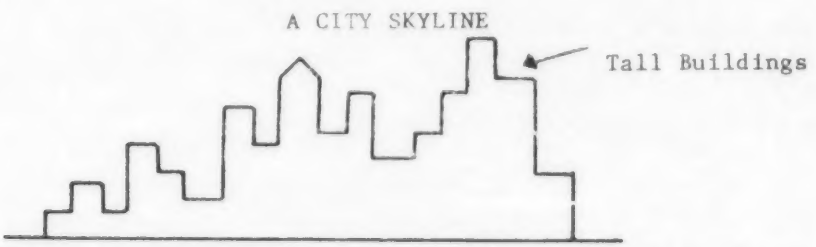
a. What is a dam? How does a dam alter the landscape?

b. How does a reservoir differ from a lake?

c. Why does man build dams and create reservoirs in a desert?

d. Why would you expect to find a high population density near a dam in a desert?

6. Urbanization. Urbanization is the process of building cities. A city is a cluster of people, buildings, and streets in a small area. A city is an island of high population density surrounded by rural areas. Even a village with a few buildings is a greatly altered landscape. A big city is a completely changed landscape. Look at the diagram of a big city skyline below.



a. Why is it impossible to tell what the natural landscape was like before the city was built?

b. Why is it possible for a person in a big city to go for days without seeing the bare earth? Is this possible for a rural person? Why not?

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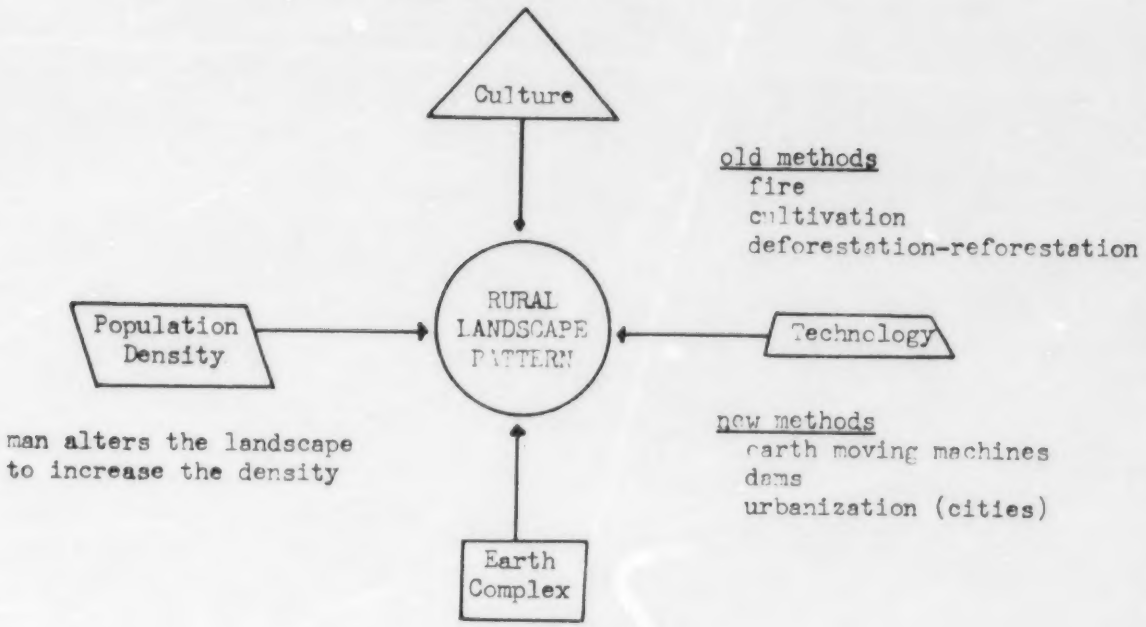
Study the Model below.

RURAL LANDSCAPE MODEL



natural landscape

a. What is a natural landscape. Why are there very few real natural landscapes?

b. What are three new types of modern technology that man uses to change the landscape?

c. What are three old methods that all cultures use to change the landscape?

d. Man is always changing the landscape. How do his changes usually affect the population density?